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16 January 1985

CHINA REPORT
ECONOMIC AFFAIRS

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NATIONAL POLICY AND ISSUES

MORE URBAN FAMILIES ABLE TO BUY APARTMENTS

OW141046 Beijing XINHUA in English 1029 GMT 14 Dec 84

[Text] Beijing, 14 Dec (XINHUA)--About 350,000 families in 80 cities will be able to buy subsidized, government-built apartments, totaling 18 million square meters of floor space, in 1985, the ECONOMIC DAILY reports today.

Since the beginning of 1984, 53,000 urban households have moved into such new homes, the paper says.

In all, the China Housing Construction and Development Company has completed 116,000 apartments with a total floor space of 5.82 million square meters for sale in cities since early this year, the paper says.

The company will also sell shop and hotel buildings next year.

Since 1982, the sale of government-built apartments to individuals has been tried out in four cities--Zhengzhou, capital of Henan Province, Changzhou in Jiangsu Province, Shashi in Hubei Province and Sipeng in Jilin Province.

Prospective apartment-owners pay only one-third of the cost--the balance being covered by their work units or local governments. Buyers may pay in installments over a period of 5 to 20 years.

The proceeds from apartment sales will again be used for housing construction.

The purchase of individual apartments marks a major step in the ongoing reform of housing management in China. It is aimed at commercializing housing to reduce the burden on the state treasury and ease the acute housing shortages in cities.

Generally, housing in urban areas is built and distributed by work units and local governments. Rent is nominal, barely enough to cover maintenance and repair costs.

CSO: 4020/51

NATIONAL POLICY AND ISSUES

WAN LI DISCUSSES MAYORS' ROLE IN URBAN CONSTRUCTION

OW181850 Beijing XINHUA in English 1604 GMT 18 Dec 84

[Text] Beijing, 18 Dec (XINHUA)--Chinese Vice-Premier Wan Li said that a mayor should be an effective administrator and know how to provide good work and living conditions for his people.

All of China's cities had an urgent need to develop the transport, commerce, service trades and recreational facilities, he said.

Wan Li, a former vice-mayor of the Chinese capital, Beijing, made the remarks here today when he was addressing 500 Chinese city leaders who were attending a meeting of China's urban economic and social yearbook council.

Wan Li pointed out that factories which cause environmental pollution should not be located in the inner cities, nor near such scenic cities as Beijing, Hangzhou and Fuzhou. Factories which harm the urban environment should be moved to nearby rural areas.

The vice-premier urged that communications be maintained between the cities and between the urban and rural areas, so that scientific, economic and other information could be exchanged for mutual benefit.

Wan Li encouraged city leaders from the better-off east coast region to invest in construction and development of the more backward western areas by giving financial and technical support through economic cooperation.

He also proposed that the cities could provide the rural areas with more and better means of transport, equipment for agricultural production and farm produce processing and daily necessities. The rural areas need to get scientific and technical knowledge from the cities, and in return can provide the cities with more labor force.

The vice-premier urged the mayors to support the factory managers in their cities and dare to institute the reforms that would do away with unreasonable economic practices.

CSO: 4020/51

NATIONAL POLICY AND ISSUES

IDEA THAT FUEL FORESTS CAN SOLVE RURAL ENERGY PROBLEM DEBUNKED

Kunming JINGJI WENTI TANSUO [INQUIRY INTO ECONOMIC PROBLEMS] in Chinese No 8, 20 Aug 84 pp 30-33

[Article by Li Baihang [2621 4102 5300], Southwestern Forestry Planning Institute, Ministry of Forestry: "Doubts About the Policy Decision on Establishing Fuel Forest Bases"]

[Text] The capitalist world is facing an energy crisis, prices for petroleum and other sources of energy are continuously rising, and energy resources are increasingly being exhausted. Faced with this grim reality, many countries are searching for new sources of energy that could be developed. The study of the development of forests as sources of energy has been launched precisely because of this situation. Since forests are a renewable energy resource they will never become exhausted if they are rationally managed. Besides, forests provide many indirect benefits (ecological benefits). For example, they regulate the climate, conserve water and soil, beautify the environment, and cleanse the air. For these reasons the study of the development of forests as an energy source has particularly attracted serious attention. In the last few years, some people abroad have suggested that "energy tree farms" be established. These so-called "energy tree farms" are man-made forest bases created for the principal purpose of gaining a source of energy. The "energy tree farms" suggested abroad were meant principally to create new sources of energy for industry. The idea behind these farms is similar to that behind our fuel forest bases, whose principal purpose is to solve an energy shortage in the rural areas. While the end uses of these two kinds of forests are different, there is, however, a basic similarity between the two: their main objective is to exploit forests as a source of energy.

Ours is a socialist country; the superior socialist system enables the rational use of natural resources, so that we will never fall into the quagmire of an energy crisis. However, we must admit that energy still remains a weak link in our national economy. Precisely because this is so, the Party Central Committee and the State Council have made the development of energy resources one of the four key areas of concern. The task of scientifically assessing the feasibility of developing forests as energy resources is therefore a responsibility that we, as workers in the field of forestry, are duty-bound to assume.

I. Forest Resources Cannot Be Man's Principal Energy Resource

Forests are a renewable resource, but they are also a natural resource with limitations. The development of forests is limited by geographical and soil conditions; limitless development of forests is not possible.

People abroad have made the following precise calculations: The annual growth of the world's present forest resources is about 3.4 to 6.8×10^9 cubic meters (annual growth rate calculated as 1 to 2 percent), converted to calorific value it becomes $33.7\text{--}67.4 \times 10^{12}$ megajoules (not counting energy losses during processing). If the total amount could be used as an energy source, it would only satisfy about 14 to 29 percent of the world's energy needs.

How are conditions in China? Our country has few forests; present forest reserves are 9.533 billion cubic meters, and the reforestation rate is 12 percent, making China 120th out of over 160 countries (and regions) of the world. According to the above-mentioned method, if we turn all the timber grown in our country into energy, forests could satisfy only about 10 to 20 percent of China's energy needs. That means that if one were to think of replacing all other energy sources with forests, one would have to expand the world's forest resources 5 to 7 times. There is no way that this can be accomplished within a short time. Moreover, if we used the amount of growth in forests as energy, it would be neither realistic nor economical. As the world's civilization progresses, mankind's need for wood and wooden articles will not only not decline, but will rapidly grow. Therefore, the possibility of using forests as a source of energy will therefore diminish more and more and may even become nonexistent.

Of course, all above computations are based on the present level of technology, and we did not consider the progress of science and technology. In the wake of scientific and technological developments, there is the possibility that man will find a method of raising the efficiency of plants to absorb solar energy, render the products per unit of fuel richer in energy, or have each unit of soil surface produce more biomass. However, up to now no one in the world has found a superior method of producing fuel biomass. On the other hand, if we want to expand the forest reserves 4 to 6 times, we would of course have to expand the forest land accordingly, and this could quite possibly aggravate the land-use conflict between forestry and agriculture and give rise to further restrictions on the future development of forestry. That is why we say that the forestry resource is a resource with limitation, a resource which mankind cannot use or develop limitlessly.

According to above calculations, we can conclude: use of the forest resources cannot completely solve the total energy needs of mankind. Figuring at the present levels of energy consumption and timber use, the forest resources can satisfy 5 to 10 percent of mankind's energy needs. That means that the energy resource of the forest can only serve as a supplementary source of energy for mankind. We can predict that for a long time to come, forests cannot become a major source of energy for mankind.

II. Adopting the Method of Fuel Forest Bases To Solve the Energy Problem in China's Rural Areas Is Unrealistic

Ours is a large country of 1 billion people, of whom about 80 percent live in the countryside. The energy supply and demand in the rural areas is therefore of a decisive influence on the policy governing our country's energy resource buildup. How, then, is the present condition of energy supply and demand in our rural areas? According to a report by Professor Yang Jike [2799 4764 3784], chairman, Special National Committee on Energy Resources in the Rural Areas (see GUANGMING RIBAO, 9 December 1982), and the data contained in the China Forestry Association's "Summary of an Academic Discussion of Forests as Energy Resource," we can summarize the present condition of energy resources in the rural areas more or less as: energy resources are seriously deficient, the composition of energy resources is but of one single type, and the methods of combustion are backward.

The serious deficiency of energy sources. According to the above, a considerable part of our 800 million peasants lack firewood for 90 to 150 days during the year. In areas with serious shortage, they are actually without firewood half the time every year. In Sichuan Province, for instance, there are actually 218 counties where villagers are without firewood for their daily needs for from 1 to 8 months; half of the peasants throughout the province are without firewood for an average of 4 months every year. In a certain locality in Guizhou Province, half of the peasants can cook only one meal a day due to the serious shortage of firewood; they were even driven to cutting down tea-oil trees for firewood for mere subsistence. Where there are no forests, the peasants dig up the vegetation that protects the soil and holds the sand and use it for firewood, thereby causing serious loss of soil due to erosion. Since there is this shortage of all energy even for daily use, how can there be any talk of developing rural industry? Without a solution to the rural energy problem, modernization of agriculture is nothing but idle talk.

The composition of energy resources is but of one type. According to statistical material on rural energy sources throughout the nation organized by districts, of the energy consumed in the rural areas of the entire country during 1977 68.3 percent was composed of biomass; in the energy used for livelihood requirements, the proportion was even higher (85.76 percent). That means that our rural areas rely for their sources of energy on the stalks of straw, firewood and charcoal (firewood and charcoal materials account for only about 13 percent). Coal and electric power make up only a very small proportion in the composition of the sources of energy consumed in the rural areas.

Combustion methods are backward. The peasants presently obtain heat mainly by the method of directly burning biomass. This is a most primitive and most backward method of combustion, where over 50 percent of the calorific value is being lost. On the one hand there is this serious shortage of energy sources, while on the other fuel is wasted in large quantities. In Yunnan Province, for instance, it is estimated that 1,740 [sic] cubic meters of firewood are burnt annually, which amounts to 64.7 percent of the total consumption of forest material throughout the province, and this one item alone exceeds the 18 percent annual growth rate in the forests of Yunnan. If this is allowed to go on indefinitely, how can there still be talk of raising the rate of reforestation? It is impossible even to safeguard the forest resources that still exist. The forest resources of Yunnan Province amount to 980 million

cubic meters (result of a 1979 survey). If the whole available quantity were used as fuel and burned up at the present rate, it would only last for about 100 years. The total quantity of firewood and charcoal used as fuel throughout the entire country is about 70 million cubic meters, which is over half of the annual growth of the country's forests and one-third of the annual consumption of forest resources throughout the country. Figured at 8 cubic meters per mu of standing forest, the burning of firewood alone destroys 8.75 million mu of forest annually throughout the country. These figures show that one of the major causes for the destruction of our forests is the backward method of cutting down trees for firewood. Without a solution for the needs of energy for daily use in the rural areas, there is no way to protect or develop forests.

Faced with the reality of serious shortages of energy in our rural areas, how are we to find a solution? As early as the 1950's, the Ministry of Forestry put forward the slogan of establishing fuel forest bases, but the anticipated results were not achieved. What was the reason? In my opinion the crucial point is that the personnel who had put forward the slogan, lacked any "figure-oriented" concepts when it comes to the quantitative needs of energy sources in the rural areas of our country. They had no idea how many fuel forests it would take to satisfy the needs of energy for the livelihood of the rural population. Besides, the reason why this slogan could not be put into practice is that it runs counter to objective economic laws.

First of all, let us calculate: how many fuel forests would it require throughout the whole country to satisfy the needs of energy for the livelihood of the rural population? According to the actual survey data for the rural areas of Yunnan Province, every peasant household requires annually about 3.4 cubic meters of firewood. According to the growth rate of southern fast and abundantly growing trees (eucalyptus), the said requirement could only be satisfied by a 6-year growth of 6 mu man-made forest. If we want to satisfy the energy needs of the whole rural area throughout the country, the whole country must plant 960 million mu of fuel forest. It is estimated that the whole country has about 1.2 billion mu of barren hills and uncultivated land suitable for tree-growing. That means, to completely solve the energy problem for the people's livelihood in the rural areas, fuel forests must be created on most of the barren hills and uncultivated land suitable for tree-growing throughout the country. This is completely unrealistic. Besides, even if fuel forests could be created on all the barren hills and uncultivated land suitable for tree-growing, and the trees were already there, it is still not certain that this would solve the problem of energy needs for the livelihood of the rural population, because we know that the areas most in need of fuel are the plains, where all land is under cultivation and where it would be impossible to grow forests. The barren hills and uncultivated land suitable for tree-growing are all in the mountainous border regions far away from the plains. After the trees have grown in the forests, the peasants who lack firewood would not be able to get it (if one were to rely on transportation, the poverty-stricken peasants, we are afraid, would not be able to pay the freight). That means that, apart from doing our calculations, we also have to be aware of the distances between the afforestation and the places where the peasants are who need the firewood. Otherwise, we will find the peasants unwilling to grow forests, and even if they had grown the trees, they would

be unable to obtain any benefits from them. The actual conditions are always: in the areas where there is a shortage of firewood, there is almost no land to grow forests; in areas suitable for tree-growing, there is usually still firewood available, and the peasants do not feel an urgency and show little enthusiasm for the creation of fuel forests. This may also be one of the reasons why the creation of fuel forests remained unsuccessful for such a long period of time.

Second, afforestation takes a long time and actual benefits cannot be expected the same year; this is therefore no solution for a situation of extreme urgency.

Third, most importantly, the economic results from growing fuel forests are unsatisfactory. Taking the growing of man-made forests of eucalyptus trees as an example, according to this writer's investigations at the Leizhou Forest Bureau of Guangdong Province, the standing stock of 1 mu of eucalyptus trees grown in 6 years is about 3 cubic meters, i.e., the average annual growth amounts to 0.5 cubic meters. If all is used as firewood, and figuring at 10 yuan per 100 kilos, the gross income would be about 100 yuan, but using this quantity of wood as building material (or as mine props), the gross income would be about 100 yuan, while used for shaved boards or as paper raw material it would bring 2 to 3 times more than if used as fuel. The above shows the results in the use of only one kind of tree, actual conditions may even be more complex. If the conditions of geography and soil permit, people could turn to growing more profitable types of trees (such as fruit trees, woody oil-bearing or woody foodgrain crops, etc.) and in this way the economic results would be much higher. For instance, in Greece, which is a country with extremely dry hills and not very good soil, the peasants are very well off because olive trees are grown over wide areas of the countryside. I am therefore of the opinion that if forestry is to be developed, we must not merely stop at propagating "planting trees to make forests," but must, according to the actual conditions, show the peasants the actual way to prosperity by growing trees.

If we do not plant fuel forests and use as fuel the leftover materials from timbering and processing material that is not being used now, it could at best solve only 10 percent of the energy needs of the rural population, which is far from satisfying the total demand.

In consideration of the above reasons, it is my opinion that the idea of trying to solve the energy needs of the rural population of China by growing fuel forests is not consistent with reality; it is a policy decision that lacks economic concepts; one may even say it is a blunder that exploits our efforts to build up the energy resources of our country. Not only do I oppose the creation of fuel forests, but I also believe that we must eliminate as quickly as possible the backward methods of directly burning biomass.

III. A Solution to the Problem of Energy Sources for China's Rural Areas

According to the above analysis of the situation, the basic policy in the question of providing energy sources for our rural areas must be: opening up

new sources of energy, establishing a varied structural system of energy sources, reforming the methods of combustion and raising thermal efficiency. Moreover, we must also be aware of the fact that although income among vast numbers of our peasants has greatly increased since the 3d Plenum of the 11th CPC Central Committee, the peasants in the mountainous areas are very poor. Every development of whatever energy source must be carried out on the principle of small investments and quick results. Because of the low educational level in our rural areas, we must at the same time promote the use of simple and convenient sources of energy. Repeated comparisons carried out by this writer as to coal, electricity, solar energy, and methane have convinced me that methane is presently most appropriate for use in the rural areas.

Methane is also a reproductive energy source. Using methane as a fuel basically overcomes in a fundamental way the various drawbacks of directly burning biomass, raises thermal efficiency, and improved hygienic conditions. The promotion of methane has a history of over 20 years in our country, the technique is well mastered and much experience has been acquired; this has already become known worldwide. However, as a result of the great hubbub about methane at the time of the "great leap forward," there are still some people who shake their heads at the mention of methane. In my opinion this is not justified. Now is the time to restore the true picture of what methane really is! It is gratifying that through its long and torturous history, methane has indeed regained the confidence of the people and a new "methane enthusiasm" is sweeping the country. Looking at the example of Yunnan Province: up to the end of 1983, over 3,100 methane-generating pits have been built throughout the province, of which 92 percent are still in regular use. In the suburban districts of Kunming up to the end of the first half of 1983, 3,539 methane-generating pits had been built, 52 communes have started experiments with methane, comprising 86.6 percent of the 60 communes in the suburban districts; there are in addition 35 production brigades (villages) that are turning to methane production. Many people have become aware of the benefits of methane operations and are asking for methane installations. Yunnan Province, therefore, plans to build 50,000-70,000 methane-generating pits during the period of the Sixth 5-Year Plan and to raise that figure to 200,000-300,000 during the period of the Seventh 5-Year Plan. We believe that methane is a new source of energy with great potential and must be studied and promoted most energetically.

Compared with firewood and charcoal, hydroelectric power and solar energy, methane has the following advantages: 1. It occupies little or almost no space. Qiaojia County in Yunnan Province constructed one type of methane-generating pit that combines toilet, manure storage and methane container. It is convenient to operate and also saves space as compared to the building of a separate methane-generating pit. 2. It requires little investment and yields fast results. According to statistical material at the methane office of Yunnan Province, the cost of one methane-generating pit is about 150-200 yuan, and it is operative 1 month after construction. 3. The technology involved is simple and it is easily managed. Peasants can master the technique after a short training, not as in the case of hydroelectric power which requires specialized technical staff to develop. 4. It saves raw materials

and yields high economic results. Calculating at the present level of technology, one household of five or six heads uses 1.0-1.2 cubic meters of methane as production fuel, which is 360-400 cubic meters a year. To produce this quantity of methane requires only 1,000 kilos of straw stalks and 4,500 kilos of feces and urine. If straw stalks were burnt directly, 10 kilos would be required per day, or 3,600 kilos per year. There is here a difference of 2,600 kilos between the two methods, which means a difference of somewhat over 70 yuan. The savings of this item of raw material alone can offset the investment in the methane-generating pit in 2 to 3 years. Moreover, after fermenting, the biomass is an excellent organic fertilizer. According to estimates, one methane-generating pit can produce in 1 year organic fertilizer to the value of about 50-60 yuan of chemical fertilizer. 5. It overcomes the drawbacks of directly burning biomass, raises thermal efficiency, is clean and hygienic and causes little pollution. 6. Development of methane is an important means of protecting and developing forestry. Precisely for this reason, the development of methane must not be left an affair of energy departments alone, but should also be actively supported by the departments of the Ministry of Forestry, who should take the promotion of methane firmly in hand as an important measure of developing forestry.

Of course, methane also has its limitations. When the temperature is close to zero degrees, it is not possible to generate methane. It is therefore still difficult to develop methane use at high elevations with cold temperatures. Even in Yunnan Province, methane can only be used for an average of 9 to 11 months per year. In the northern regions of our country, the time when methane can only be used is short. It is then necessary to use other energy sources as supplements. China is a country with a vast territory and a huge population; it would be unrealistic to try to solve the problem of the whole country with the use of only one kind of energy source. Even in the areas where methane can be used, it is necessary to consider the simultaneous development of other sources of energy and to gradually establish a system of several energy sources with one type as the primary source of energy.

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NATIONAL POLICY AND ISSUES

BRIEFS

INTERCITY HOUSING EXCHANGES--Beijing residents now may exchange living quarters with people in 18 other big and medium-sized cities across the country. A special centre to handle the exchanges was opened last Thursday in Dongjiaominxiang Street, BEIJING RIBAO reports. Called the "National Guiding Centre for Housing Exchanges in Big Cities," the centre came into being as a result of a conference on the subject last August in Harbin, Heilongjiang Province. Present were representatives from 17 provinces and cities. Wuhan, Harbin, Shanghai, Tianjin, Fuzhou, Dalian, Shenyang, Changchun, Chengdu, Nanjing, Xi'an are included on the exchange list for Beijing residents. [Text] [Beijing CHINA DAILY in English 14 Dec 84 p 3]

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ECONOMIC DEVELOPMENT ZONES

SHANGHAI ECONOMIC ZONE INDUSTRIAL PRODUCTION ANALYZED

Hunan JINGJI DILI [ECONOMIC GEOGRAPHY] in Chinese No 3, Aug 84 pp 185-190

[Article by Hong Changshi [3163 2490 0099] of the Nanjing Research Institute of Geography, Chinese Academy of Sciences, with the assistance of Yu Zhixiang [7411 0037 4382]: "The Distribution Characteristics, Development Factors and Existing Problems of Industrial Production in the Shanghai Economic Zone"]

[Text] The Shanghai Economic Zone is located in the Chang Jiang Delta. Because of its superior geographical location and previous development, it has become the most developed area in the economic, scientific and technological and cultural sectors and one of the biggest industrial bases in China. This article will make a basic analysis of the current distribution characteristics, the development factors and existing problems of industrial production in this economic zone and point out such issues as the direction of its future development and rational distribution.

I. Current Distribution Characteristics of Industrial Production

Industry is the leading sector of the national economy in the Shanghai Economic Zone. The value of its total industrial and agricultural output in 1982 was 127.674 billion yuan, of which the total industrial output value accounted for 83.44 percent or 19.1 percent of the nation's total. Its light industrial output value accounted for 22.5 percent of the total national industrial output value. Many industrial products of the Shanghai Economic Zone have taken up important positions in the country. For example, power-generating equipment accounts for 30.5 percent of the nation's total, machine tools 24 percent, industrial steam turbines 86.5 percent, oxygen-producing machines 60 percent, small electrical machines 31.2 percent, walking tractors 26 percent, cotton yarn 22.8 percent, cotton 23.7 percent, silk products 53.8 percent, bicycles 29.8 percent, sewing machines 28 percent and wristwatches 36.6 percent.

1. The industrial structure focuses on small enterprises and the textile, machine-building and processing industries.

According to statistics, the economic zone had 38,906 industrial enterprises in 1982, of which 98.3 percent were small enterprises, 1.3 percent were medium-size enterprises and 0.4 percent were large enterprises. Based on

the calculation of industrial output value, small, medium-size and large enterprises accounted for 59.7, 19.6 and 20.7 percent, respectively.

The industrial structure of the economic zone was originally geared toward the light and textile industries. Later, it was gradually developed so that light and heavy industries received equal emphasis. During the initial post-liberation period, the proportion of light industry in all cities of the economic zone was over 80 percent. However, because of the demand of light industry for the equipment and raw materials of heavy industry and the emphasis on giving priority to the development of heavy industry, the stress of investment has shifted to heavy industry, thus gradually bringing about a situation in which equal attention is given to light and heavy industries. For instance, between 1950 and 1978, the total industrial investment of Shanghai Municipality was 11.145 billion yuan, of which 83.6 percent was for heavy industry and only 16.4 percent was for light industry. Heavy industry developed much faster than light industry, resulting in a marked change in the proportion of light and heavy industries. Since the 1970's, this change has shown a new trend of development. For example, the proportion between light and heavy industries in Shanghai Municipality was 47:53 in 1975. It changed to 50:50 in the late 1970's. However, light industry was further developed through the industrial readjustment during the period from the 3d Plenary Session of the 11th CPC Central Committee to the early 1980's. For instance, the proportion of light industry became 56 percent in 1982. During the same year, the proportion of light industry in Suzhou, Wuxi and Changzhou Cities in Jiangsu Province was 66, 67 and 61 percent, respectively. Cities in Zhejiang Province (in the delta area) have always been dominated by light industry, and therefore, there have been very few changes in the proportion of light and heavy industries over the years. In 1982, the proportion of light industry was 65 percent in Hangzhou City, 72 percent in Ningpo City, 67 percent in Jiaxing City, 68 percent in Huzhou City and 74 percent in Shaoxing City.

However, after Liberation, vigorous efforts were made to develop the metallurgical, machine-building, chemical, ship-building and other heavy industries while establishing step by step the electronics, instrument and meter, petrochemical and other fledgling industries, thus forming a complete and comprehensive national industrial base, with the textile and machine-building industries predominant. Based on calculations of annual output value in 1982, the machine-building industry accounted for 27.18 percent, the textile industry 26.01 percent, the chemical industry 12.67 percent, the metallurgical industry 8.58 percent and the food industry 7.75 percent. Among the 10 cities in the economic zone, 3 cities--Nantong, Huzhou and Shaoxing--are dominated by the textile industry and the other 7 cities have textile and machine-building industries as their leading industrial sectors (Table 1).

There are not very many energy resources and mineral raw materials in the economic zone. Fuel and raw materials needed for its industrial production are supplied mainly by neighboring areas or other parts of the country. Most of its industrial products are either shipped and sold to other parts of the country or are exported. Therefore, it is a typical industrial district that processes materials supplied by other areas. Major raw materials

Table 1. The Structure of Industrial Sectors in the Shanghai Economic Zone
in 1982 (%)

<u>Sector</u>	1. Metallurgical	2. Power	3. Coal	4. Petroleum	5. Chemicals	6. Machinery	7. Building materials	8. Timber	9. Food	10. Textiles	11. Sewing	12. Leather	13. Paper making	14. Culture & education	15. Others
<u>City</u>															
Shanghai	11.58	2.12		1.76	13.25	29.65	1.48	0.95	5.52	23.18	2.67	0.81	0.97	3.32	2.34
Suzhou	6.08			0.28	15.30	26.59	2.90	0.75	7.09	28.73	1.60	0.74	1.77	4.90	3.27
Wuxi	5.32	0.11	0.29	0.43	13.68	29.41	1.35	0.43	5.07	37.34	2.15	0.48	0.41	1.19	2.34
Changzhou	3.54	0.43	0.08		13.14	26.82	2.49	0.39	5.02	41.65	1.72	0.32	0.12	1.00	3.28
Nantong	0.21	6.18	0.04		16.50	17.56	0.88	0.74	6.28	41.81	1.43	0.52	0.84	3.32	3.69
Hangzhou	5.90	1.71		1.56	12.28	27.22	1.98	1.18	12.16	24.53	0.24	0.96	2.76	3.18	4.34
Ningbo	6.10	0.13			10.63	25.97	1.91	2.14	18.85	23.90	2.02	0.69	0.59	3.61	3.46
Shaoxing	11.44	0.28	0.28		5.18	16.54	4.28	0.74	17.54	31.43	3.49	1.48	0.14	4.15	3.23
Huzhou	1.77	0.66	0.09		8.76	15.09	10.92	1.24	12.04	40.25	2.97	2.44	0.37	1.07	2.33
Jiaxing	3.32				9.50	20.06	5.16	0.75	15.03	29.70	2.56	0.71	8.51	1.18	3.52
Total	8.58	1.83	0.32	1.38	12.67	27.18	3.30	0.90	7.75	26.01	2.52	0.84	1.02	3.03	2.67

for light industry are farm products. Heavy industry is mainly based on the manufacturing industry. In the economic zone, the manufacturing industry accounts for 59 percent of the heavy industry, the raw material industry accounts for 40 percent and the mining industry accounts for only 1 percent. Generally speaking, the proportion of the raw material and power industries is relatively small. Because the volume of supplies from other areas often falls short of demand, definite contradictions exist in the development of these industries.

2. The industrial development level is relatively high, but there are sizable disparities within the economic zone.

The Shanghai Economic Zone is one of the most economically developed areas in China. Its per-capita industrial output value in 1982 reached 2,106 yuan, 2.8-fold more than the 549-yuan national average. The per-capita industrial output value of Shanghai Municipality was 7,985 yuan, the highest among the 10 cities in the economic zone and 13.5-fold more than the national average. The per-capita industrial output value was over 5,000 yuan in the four cities of Jiangsu Province (Table 2).

If a county is used as a unit, the disparities in the industrial level of different counties are even greater. For instance, the per-capita industrial output value is over 1,000 yuan in 10 counties on the outskirts of Shanghai

Table 2. Indexes for the Industrial Production Level of the 10 Cities in the Shanghai Economic Zone in 1982

Unit: yuan/person

Index	Per-capita industrial output value	Non-agricultural per-capita industrial output value	Labor productivity of all industrial workers	National average	Economic zone	Shanghai Municipality	Wuxi City	Changzhou City	Suzhou City	Nantong City	Hangzhou City	Ningbo City	Shaoxing City	Huzhou City	Jiaxing City
549	2,106	7,985	6,038	7,825	4,093	5,887	4,235	3,832	1,014	945	1,303				
3,903	7,615	8,047	7,573	9,556	6,008	9,787	5,392	5,224	4,999	5,091	5,453				
9,406	14,633	23,307	18,009	18,980	13,757	16,765	14,057	12,703	8,834	9,144	10,506				

Note: Shaoxing, Huzhou and Jiaxing Cities include counties originally under their jurisdiction.

Municipality and in 14 other counties including Jianyin, Changshu and Taicang in Jiangsu Province and Zhenhai in Zhejiang Province. The highest is 4,188 yuan in Shanghai County, which is 6.6-fold more than the national average. However, 25 counties, 46 percent of all the counties in this area, have a per-capita industrial output value lower than the national average. It is not difficult to see through these data that the industrial development level of the Shanghai Economic Zone is relatively high, but its regional disparities are also substantial.

3. The industrial space structure is centered on concentrated cities and the group distribution on the axes of three railways.

Shanghai Municipality is the center of industrial distribution in the economic zone. It has 4,873 industrial enterprises, accounting for 12.5 percent of all enterprises in the economic zone, but its industrial output value accounts for 47 percent of the economic zone's total. Suzhou, Wuxi, Changzhou and Nantong Cities have 2,068 industrial enterprises, accounting for 5.3 percent of the economic zone's total, and their industrial output value accounts for 13.5 percent of the economic zone's total. Hangzhou, Jiaxing, Yong (Ningbo) and Shaoxing Cities have 4,030 industrial enterprises, accounting for 10.4 percent of the economic zone's total. It is thus evident that the central part of the economic zone--Shanghai Municipality and the other nine cities--which contributes 70 percent of the industrial output value in the economic zone has the most concentrated industrial distribution and is the core of the economic zone.

The factory distribution of large and medium-size cities in the economic zone has the characteristic of wavelike distribution around the centers of the mother cities. This is especially outstanding in Shanghai Municipality. Using factory density as a target to analyze the disparities among the urban areas and the inner and outer suburbs of Shanghai Municipality can fully explain this characteristic.

(1) The mother city (the urban area): within a radius of 10 km in the urban area of Shanghai Municipality, which includes 10 districts (Wusong and Minxing are included in the inner suburbs) and covers an area of 148.96 square km, the average factory density is 31 factories per square km. In Luwan and Jingan Districts, the factory density is over 50 factories per square km, which is the highest in the whole country. (There are of course some irrational aspects and some factories need to be moved out.)

(2) The industrial district of the inner suburbs: this district is within a radius of 20 km; consists of the Caohejing, Changqiao, Gaoqiao, Wusong, Wujiaochang, Yaopu and Wujing industrial districts; and covers an area of 28.35 square km. The average factory density in this district is 9 factories per square km and the highest is 23 factories per square km in Caohejing District.

(3) The industrial district of the outer suburbs: this district is within a radius of 40 km; consists of the Minxing, Jiading, Anting, Songjiang and Jinshanwei industrial districts; covers an area of 28.31 square km; and has

180 factories. The average factory density in this district is 6 factories per square km and the highest is 11 factories per square km in Anting District.

These figures show that from the mother city to the industrial district of the inner suburbs and then to the industrial district of the outer suburbs, the factory density changes from 31 factories per square km to 9 and then to 6; the density of industrial staff members and workers changes from 13,490 people per square km to 7,210 and then to 5,094; and the density of industrial output value changes from 304.22 million yuan per square km to 217.99 million yuan to 102.19 million yuan.

The industrial distribution of the economic zone focuses mainly on three major railways--Huning, Huhang and Hangyong--indicating the great impact of communications and transportation on industrial distribution. The industrial distribution of the economic zone may be divided into three concentrated areas:

(1) The concentrated industrial area of Suzhou, Wuxi and Changzhou Cities has the Huning line as its axis. Within a distance of 81 km there are two large and one medium-size cities--Suzhou, Wuxi and Changzhou. This is one of the areas with crowded cities and towns and concentrated industrial distribution in China. These three cities had 1,697 factories in 1982. Their industrial output value was 12.1 billion yuan, or 11.4 percent of the total industrial output value in the economic zone. Their factory density is relatively high, next to that of the Shanghai area. For example, the factory density is 4.55 factories per square km in Changzhou City, 4.12 in Suzhou City and 2.92 in Wuxi City.

(2) The concentrated industrial area centered in Hangzhou and Jiaxing Cities has the Huhang line as its axis. In Hangzhou City, the factory density is 2.3 factories per square km and the density of staff members and workers is 819 people per square km. In addition to Hangzhou and Jiaxing Cities, there are also Shanghai, Songjiang, Jiashan, Haining and Yuhang Counties and dozens of townships on the Huhang line. These are all concentrated industrial areas.

(3) The concentrated industrial area of Shaoxing and Ningbo Cities has the Hangyong line as its axis. In Ningbo City, the factory density is 2.5 factories per square km and the density of staff members and workers is 590 people per square km. In addition, the county and urban industries distributed in Shaoxing City and along the railway also form a concentrated industrial area.

Furthermore, the distribution of factories along railways and rivers is another characteristic of industrial distribution in the economic zone. On the one hand, it is convenient to transport raw materials and products; on the other, it is convenient to supply water to those industries that need water if the factories are on the banks of rivers.

4. Rural and small-town industries occupy an important position in the rural economy.

Although rural and small-town industries have a relatively long history of development in the economic zone, they did not develop very fast until recent years. They have achieved a faster development especially since the 3d Plenary Session of the 11th CPC Central Committee. Rural and small-town enterprises have become a pillar of the rural economy. They also have an important position in the industrial production of the economic zone. For instance, the Shanghai Economic Zone had 21,589 rural and small-town enterprises in 1982, accounting for 55.5 percent of all factories in the economic zone. Their industrial output value was 10.21 billion yuan, accounting for 9.6 percent of the total industrial output value and half of the total agricultural output value of the economic zone. The ratio of rural and small-town industries is higher in some counties. For example, rural and small-town industries contribute 62 percent of the total county industrial output value in Shazhou County, 59 percent in Wuxi County and 56 percent in Yin County. They have played a marked role in supporting agricultural production, accelerating agricultural development, supplementing and coordinating with large industries, producing certain consumer goods, invigorating the market, providing jobs for surplus labor in rural areas, promoting market-town construction and providing taxes and accumulating funds for the state.

II. Basic Factors Affecting Development of Industrial Production

1. Raw Materials

Raw materials are the material foundation for the development of industrial production. They affect to a large extent the structure, nature and scale of industry. There are very few mineral resources in the economic zone and its neighboring areas. Although there are some metal mines such as for iron, copper, beryllium and tungsten, their deposits are mostly small or medium-sized and are located mostly in Zhejiang Province. There are also very few coal resources, far from being able to satisfy the needs of industrial development. However, there are quite a few resources of building materials and special nonmetal mines. For example, the proven deposits of fluorite, alumstone, bentonite, pyrophyllite and zeolite in Zhejiang Province are among the largest deposits in China. There are also some large and medium-size deposits of limestone, kaolin, marble and flux silica. These mineral resources play a definite role in the development of the local cement, ceramics, metallurgical and chemical industries in the economic zone.

Agricultural resources are the main sources of raw materials for the industry in the economic zone, especially light industry. About 64 percent of the raw materials for light industry come from farm products. The proportion is higher than 80 percent in some cities such as Huzhou, Jiaxing and Changzhou. Agricultural resources are relatively rich in the economic zone and its neighboring area. For instance, the grain, cotton, hemp, silkworm cocoon, poultry and aquatic products of the economic zone all have a definite position in the country. Moreover, the establishment of various farm product bases has effectively accelerated the development of the light and textile

industries. For instance, China's largest bast fiber-producing area is located on the banks of the Qiantang Jiang. Back in the 1950's, the state built the Zhejiang Hemp Mill--the largest of its kind in China--in Hangzhou City. This mill now has 11,696 spindles and 124 spinning machines and produces 70 million gunnysacks a year, accounting for a fifth of the gunnysack output of the country. For example, the Shanghai Economic Zone is the biggest textile industrial base in China. In 1982, there were 1,095 cotton mills in the economic zone. Their cotton yarn output was 758,000 tons, accounting for 22.8 percent of the nation's total. Their cotton cloth output was 3.59 billion meters, accounting for 23.7 percent of the nation's total. An important condition for forming a textile industrial base of this scale is that the economic zone and its neighboring areas are an important cotton-producing area in China. For another example, the economic zone is the biggest silk industrial base in China. In 1982, it produced 490 million meters of silk products, accounting for 54 percent of the nation's total and has been praised as "the home of silk." It has been developed on the basis of "the motherland of the silkworm."

2. Water Resources

Water is one of the important natural resources for the development and distribution of industry. According to the amount of their water consumption, enterprises may be classified into four categories: extra-large, large, average and small water consumption enterprises. Based on this classification, 5.2 percent of all industrial enterprises in the economic zone belong to the extra-large water consumption class, 2.8 percent belong to the large water consumption class, 15.3 percent belong to the average water consumption class and 76.7 percent belong to the small water consumption class. Judged by the situation as a whole, the economic zone is based on small water consumption enterprises and its water resources basically can satisfy the needs of the development of various industries. This is one of the important factors for the rapid development of various industries in the economic zone. Some large water consumption enterprises such as the metallurgical, power, chemical, petrochemical, textile and printing and dyeing industries generally can all enjoy the guarantee of a sufficient water supply. However, because industrial distribution is relatively concentrated in the economic zone, and because of rapid industrial development, some large and medium-size cities such as Shanghai, Ningbo, Changzhou and Jiaxing have in recent years caused water consumption to increase sharply, resulting in the excessive utilization of underground water and cases of surface subsidence. Because of the industrial pollution of surface water, the daily and industrial water supplies have also been affected. The phenomenon of a water shortage has already emerged in some cities. For example, Changzhou has already brought up the subject of diverting water from the Chang Jiang to solve its water supply problem.

In addition, the mountainous areas of Zhejiang Province in the economic zone have a definite quantity of water resources. Among them are Xinanjiang and Fuchun Jiang--two large hydroelectric power stations which have already been developed and utilized. Their generating capacity is 959,700 kw. Their

power output in 1982 was 2.47 billion kwh, accounting for 8 percent of the total power output in the economic zone.

3. Communications

Communications and transportation are the link between industrial production and marketing. With the Donghai in the east, the Chang Jiang in the north and the Qiantang Jiang in the south, the Shanghai Economic Zone has a convenient communications situation. It is linked to all parts of China and all countries of the world by the Chang Jiang and the Dong Hai. China's major natural resources such as coal, iron, petroleum and timber are mostly in west and north China. China's sea transit lines are north- and southbound and the major Chang Jiang transit lines are east- and westbound. Therefore, through inexpensive river and sea transportation, natural resources can be transferred to the economic zone and at the same time the industrial products of the economic zone can also be shipped to other parts of China. The economic zone has four large foreign-trade ports--Shanghai, Nantong, Ningbo (including Beicang and Zhenhai ports) and Zhangjiawan. They now have 134 berths for vessels at or above 1,000 tons and 59 berths for vessels at or above 10,000 tons, accounting for a third of the nation's total. Each year they handle more than 100 million tons of cargo. Ningbo Port just built a modernized ore dock for vessels at 100,000 tons. It has the most advanced technical equipment. Through these ports, industrial raw materials such as iron sand, steel products, timber and cotton are imported and at the same time industrial products are exported.

Inland navigation is also well developed in the economic zone. There are 14 inland rivers such as the Fuchun Jiang, the Xinan Jiang, the Wusong Jiang, the Huangpu Jiang, the Yuyao Jiang, the Yong Jiang, the Fenghua Jiang and the Cao'e Jiang and the Jinghang Grand Canal, the Xideng Canal and the Tongyang Canal. Their major courses allow 100-ton vessels to pass. They connect 10 cities and 55 counties, forming a complete water transit system. Especially in the Tai Hu water network area, almost every county and town are accessible by water transportation. The length of inland navigation is over 36,500 km, accounting for a third of the nation's total. In addition to the water transit network, there are also the Ning, Hu, Hang and Yong railways traversing between the east and the west and 6 major highways running through 10 cities, forming a communications and transportation network that connects rivers, canals, lakes and seas, links up major and minor transit lines and closely coordinates water, land and air transportation. This plays an important role in industrial development and distribution in the economic zone.

4. Industrial and Economic Bases

The Shanghai Economic Zone is one of the areas in China where the former economic basis was relatively solid. It is also an old industrial base in China. Its development was achieved mainly through such measures as the continuous potential tapping, renovation and transformation of former enterprises. For example, Shanghai Municipality now has over 8,000 factories and 99 percent of them were formed as a result of reorganizing, rebuilding and expanding old enterprises. Backbone enterprises especially were developed mostly during

the First and Second 5-year Plan period through expansion and reconstruction on the basis of transforming old enterprises.

The Shanghai Economic Zone has a solid basis for the textile industry. It now has 4,072,700 cotton spindles and 231,300 wool spindles, accounting for 21.6 and 31.3 percent, respectively, of the nation's total. Its chemical fiber production capacity is 186,800 tons, accounting for 29.5 percent of the nation's total. The fixed assets of its machine-building industry have an original value of 5.377 billion yuan, accounting for 12 percent of the nation's total. It has 101,500 metal-cutting machine tools, accounting for 15.1 percent of the nation's total. Its steel output accounts for 14 percent of the nation's total. It is also one of China's major steel product variety bases. Its light industrial strength is also very strong. For instance, its bicycle, sewing machine and wristwatch production capacity accounts for over 30 percent of the nation's total. In sum, the rapid industrial development of the economic zone is inseparable from its former economic basis.

5. Technology

Technology is one of the most active factors in industrial development and distribution. Every region's industrial development and distribution must be closely related to its technological basis.

The Shanghai Economic Zone has developed science and technology and a large number of scientific research organizations and universities and colleges. It has 82 institutions of higher education, 201 secondary vocational schools and 542 mechanical schools. The distribution of scientific research organizations is also very concentrated. There are 585 such organizations in the economic zone. The proportion of scientific and technical personnel in the population is generally three to four times higher than that of the national average. The impact of the technological factor on the industrial development and distribution of the Shanghai Economic Zone is expressed mainly in the following ways: 1) the development of industrial production has been accelerated through designing and manufacturing new industrial equipment and renovating former equipment. For example, the machine-building industry on a weak former basis has developed from maintenance to manufacturing, from copying general products to designing and manufacturing its own and from producing basic machinery and electrical products to being able to produce major products, complete sets of equipment and high-technology supplementary equipment. This has not only armed the machine-building industry itself but has also provided equipment for other sectors of industry, thus accelerating the development of the whole industry. 2) Industrial development has been accelerated through creating new varieties and designs, continuously upgrading product quality and increasing the ability to compete. The appearance of new varieties and designs is an important sign of industrial development and technological utilization. Many new products have a leading position nationwide. 3) Production efficiency has been raised through mastering and assimilating imported advanced technologies. In recent years, a great deal of work has been done in importing advanced foreign technology and equipment. For example, Shanghai's Pengpu Machinery Plant imported from Japan's Komatsu Company a production line for large 320-horsepower bulldozers; the Shanghai

Heavy-duty Machinery Plant which produces large forgings cooperated with West Germany in producing 2,030 cold-rolling mills; the Hangzhou Oxygen Machine Plant imported technology from West Germany to produce large oxygen-producing machines; the Shanghai Light Bulb Plant imported from Japan's Matsushita Company a production line that has an annual capacity for producing 1.6 million black and white display tubes; the Jinshan Petrochemical General Plant imported Japan's petrochemical equipment; the Changzhou Textile Plant imported open-end spinning frames from Japan and weft-knitting machines from East Germany. All these have achieved fairly good results and have accelerated industrial development. In addition, the economic results of production have also been improved through popularizing and utilizing new technologies, techniques and materials.

6. Consumption

Production cannot develop unless there is a market. The Shanghai Economic Zone itself is a broad market. It has a large population, a developed economy and a fairly high consumption level. Moreover, most of its products are of good quality and are very popular in other regions. Many products also have a fairly good reputation in the international market. This conducive factor plays an enormous role in accelerating the industrial development of the economic zone.

III. Several Problems in Industrial Production and Distribution

1. Energy resources and raw materials are in short supply.

The energy shortage is extremely acute in the Shanghai Economic Zone. Coal, oil and power are very scarce. In 1982, the power output of the economic zone was 31.708 billion kwh, accounting for 9.7 percent of the nation's total; its raw coal output was 1,961,600 tons, accounting for 0.3 percent of the nation's total; and its per-capita energy resources accounted for only a fifth of the national average. However, the coal consumption of the economic zone in 1982 reached 27.6 million tons and its self-sufficiency rate was only 7.1 percent. This made the economic zone the largest coal-short area in China. The serious shortage of energy resources and the tight power supply have severely affected industrial production. For example, based on the needs of industrial and agricultural production, Shanghai Municipality lacks at least 1 billion kwh of electricity and because of this, 20 percent of the existing industrial equipment cannot be fully utilized. For another example, because of an insufficient energy supply, 15 to 20 percent of the industrial equipment and capacity in Hangzhou City cannot be brought into full play. In sum, the energy shortage is the primary problem in the development of industrial production in the economic zone.

The shortage of raw material supplies is also becoming increasingly serious in the industrial production of the economic zone. For example, raw materials for steel products, pig iron, timber, cement, caustic soda, soda ash and some farm and sideline products have for a long time been in tight supply. The allocation of some goods and materials continues to decrease and production

continues to increase, making the contradiction between them even more outstanding. For instance, between 1949 and 1982, the industrial production of Shanghai Municipality increased 5 percent a year, whereas many goods and materials under the unified supply and distribution of the state such as steel products, nonferrous metals and timber were reduced each year. The supply of raw materials for farm and sideline products was also reduced. This situation was caused by many factors, but improper production planning, overlapping plant construction and competition for raw materials were undoubtedly the major reasons.

2. The slow replacement of industrial equipment hinders further industrial development.

There is a fairly large gap between the technical level of industrial production in the Shanghai Economic Zone and the advanced international level. Most equipment of enterprises is relatively outdated and backward. The average price of equipment was made in the 1950's and the 1960's. There are also some that were made before the 1940's. Take Shanghai Municipality, for example. Large precision numerical-control machine tools account for only 6 percent of all metal-cutting machine tools owned by the First Bureau of the Machine-building and Power Industries. Half of the machine tools have been used for over 10 years and quite a few have been used for over 20 or 30 years. This situation of outdated equipment is more prominent in the light and textile industries. According to the statistics of Shanghai's textile industry, 69 percent of the 2.2 million spindles were made before the 1950's and only 8 percent were made between 1977 and 1982; 50 percent of all cotton looms were made before 1948; and 40 percent of the light industrial equipment was made in the 1930's and the 1940's. The backward and outdated situation of equipment is in sharp contradiction with the demand for realizing modernization.

3. Such phenomena as overlapping plant construction, blind plant distribution and "large and complete" and "small and complete" systems are very common.

Because of rapid industrial development and a lack of overall planning, such phenomena as overlapping plant construction, blind plant distribution and "large and complete" and "small and complete" have become quite common in recent years. For example, bicycle, sewing machine and wristwatch plants, cotton and silk mills and electric fan, water and electric meter factories have rushed headlong into producing hot-selling products, have distributed plants everywhere and have willfully expanded production capacity. As a result, many products have exceeded the capacity of the markets, resulting in huge waste and severe internal damage.

The causes of overlapping plant construction and blind plant distribution in the economic zone are analyzed as follows: 1) the barriers between central authorities have caused different sectors to produce certain products according to their own needs. For instance, the Shanghai Shipyard (belonging to the Ministry of Communications), the Shanghai Diesel Engine Plant (belonging to the Ministry of Machine-building Industry) and the Jiangnan Shipbuilding Plant (belonging to the Shipping Industry Corporation) each possess

a complete set of technology and equipment for producing large marine diesel engines. Had we built only one specialized large marine diesel engine plant or had one of the above-mentioned plants produced this product for three of them, we would have been able to save two sets of equipment. 2) The barriers between local authorities have caused overlapping plant distribution. For instance, the Suzhou Chemical Machinery Plant produces automatic control devices for minor chemical fertilizers and has great potential for supplying such devices to the whole country. Nevertheless, similar plants have been built in other areas to produce the same kind of products. 3) The barriers between central and local authorities have created even more cases of overlapping plant construction. For instance, although 50 percent of Shanghai's machine-building capacity is left unused, the Baoshan Iron and Steel Company had to build its own machine repair shop. In another instance, Changzhou and Jiaxing Cities built new hydraulic presses with an over 1,000-ton capacity, regardless of the fact that the departments of the machine-building industry already have 35 sets and that only 30 percent of them are utilized. Moreover, overlapping plant construction and blind plant distribution have also become very common in the development of small-town enterprises due to a lack of effective leadership. After many ports were opened to foreign countries, foreign-trade departments also began to distribute plants on their own and build unnecessary plants. Often because of their unfamiliarity with foreign trade customers and poor information and management, they cannot sell their goods and thereby seriously affect the state's unified control over foreign trade. At the same time, overlapping plant construction has increased investment and resulted in waste. It is thus evident that in order to solve these contradictions, we must eliminate the barriers between central and local authorities, strengthen the coordination among different regions and sectors, exercise unified planning, focus on hot-selling products, organize step by step a coordinated process of production and use the method of "coordinating internally to push toward the outside" to increase economic results.

4. The "three wastes" pollution is serious and the quality of the environment is declining.

Because the "three industrial wastes" control lags far behind industrial development in the economic zone, the quality of the environment has declined in many areas. For instance, among the 581 plants in Suzhou City, 319 discharge the "three wastes." They not only discharge a huge amount of toxic water--140,000 to 200,000 tons a day--but also affect a wide area. Rural areas in the lower reaches of rivers and cities within an area of 119 square km around the ancient city of Suzhou have all been polluted to different degrees. The water contains dozens of toxics such as phenol, cyanide, arsenic, chromium, aniline and organophosphorus and all of them exceed the discharge limits set by the state. Pollution caused by industrial waste gas is also very serious in Suzhou City. According to the 1978 statistics, up to 7,700 tons of industrial waste gas were discharged. Take Shanghai Municipality, for example. Each day, over 5 million tons of waste water are discharged into the Huangpu Jiang and its tributaries, of which over 4 million tons, equivalent to a third of the total flow of the Huangpu Jiang, are untreated. Water in the Suzhou He is black and stinky all year round. According to the calculations of the departments concerned, based on the existing industrial

structure, every increase of 100 million yuan in industrial output value in Shanghai Municipality will result in an additional 10,000 tons of waste water each day. If this situation is not changed, waste water will be increased on the average of 400,000 to 500,000 tons a day based on the 8 percent increase rate of Shanghai's industry and, by 1985, 7 to 8 million tons of waste water, equivalent to the total flow of the Huangpu Jiang, will be discharged every day. This will become an extremely serious problem.

The following are some preliminary suggestions for the industrial development of the Shanghai Economic Zone we made in accordance with the characteristics, conditions and existing problems of the industrial production in the economic zone:

First, the orientation of industrial development should switch from a traditional industrial structure which has a high material consumption, large transport volume, heavy pollution and low efficiency to a new industrial structure which has a low material consumption, small transport volume, light pollution and high efficiency. In other words, it should switch from labor- and capital-intensive industries to knowledge- and technology-intensive industries.

Second, in the organizational structure of industry, central cities should be considered as the backbone and hot-selling products as the main body to coordinate and bring along urban industries, organize a "coordinated process" and carry out specialized cooperation. At the same time, it is also necessary to eliminate regional and departmental ownership step by step and organize production, management and planning based on industries.

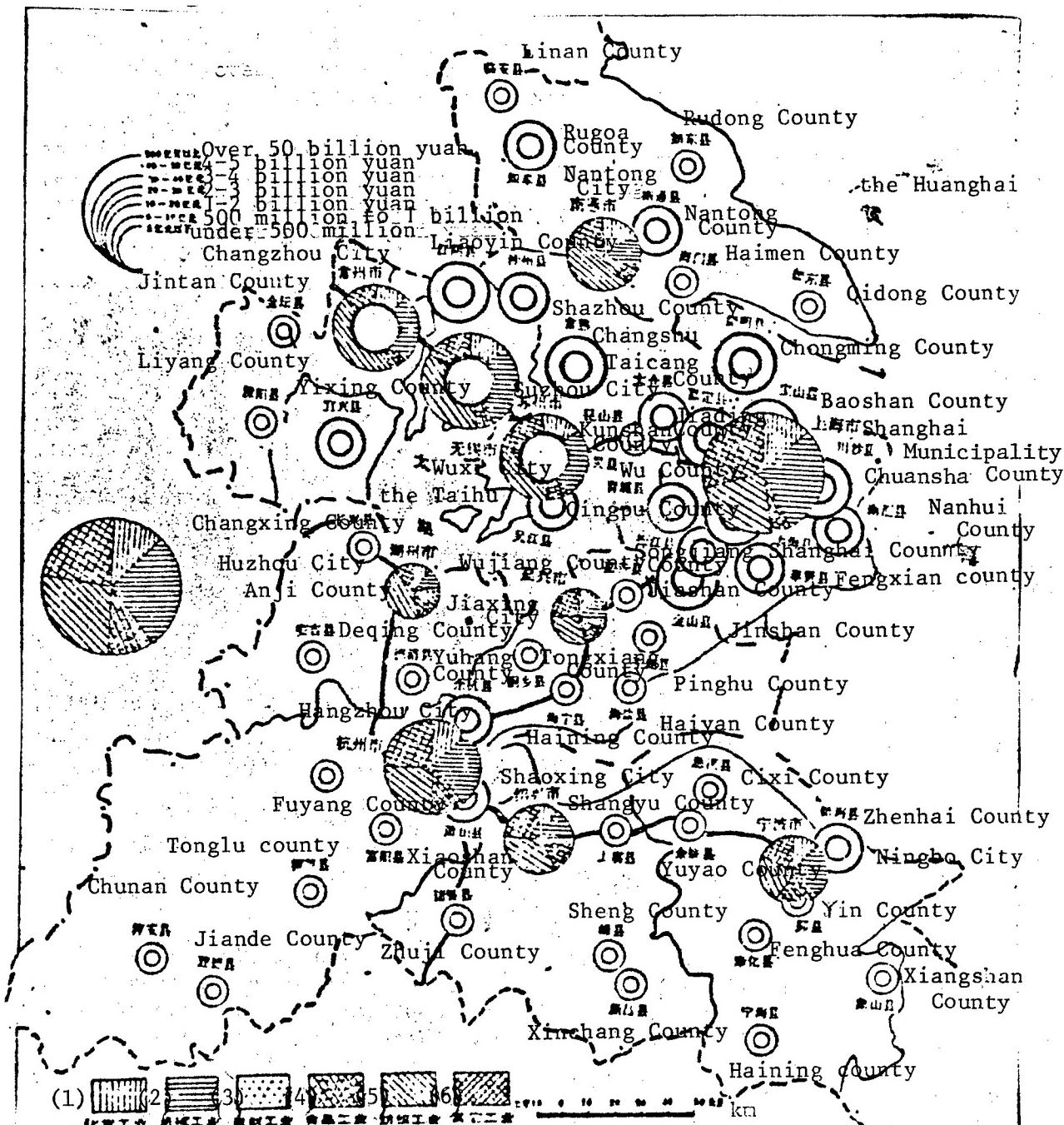
Third, industrial distribution should use central cities as the core and expand to medium-size and small cities and towns. In addition to the axes of the three railways, industries should be distributed in areas along the river (the Chang Jiang) and the coast (the Dong Hai) to form new industrial districts and areas.

Fourth, a division of labor should be established among different cities and regions to develop their own special industries according to the functions and nature of different cities.

Fifth, judged by the roads of industrialization and urbanization, a large amount of rural labor will be transferred to industries and urban areas due to the limited land and the huge population in the economic zone. Industrial development should be different in rural and urban areas. For example, large and medium-size cities should focus on high-grade, precision and advanced new industries whereas small cities and towns should still focus on the development of labor-intensive industries so as to utilize their labor resources fully.

Sixth, vigorous efforts should be made to absorb and import advanced foreign technology to replace outdated former equipment, improve production efficiency and speed up industrial development.

Sketch Map Showing the Industrial Structure, Scale and Distribution of the Shanghai Economic Zone:



Key:

- | | |
|-------------------------------|---------------------|
| 1. Chemical industry | 4. Food industry |
| 2. Machinery industry | 5. Textile industry |
| 3. Building-material industry | 6. Other industries |

12302

CSO: 4006/12

FINANCE AND BANKING

WANG BINGQIAN DISCUSSES NEED FOR 1985 FINANCIAL BALANCE

HK140529 Beijing CHINA DAILY in English 14 Dec 84 p 1

[By staff reporter Qin Xiaoli]

[Text] China is planning ahead of time to fight any possible financial disruptions next year when the long awaited restructuring of wages and prices take place.

Wang Bingqian, finance minister and State Councillor, said that to achieve a financial balance next year is "an important guarantee to the reforms of the economy." This is not only a financial matter but a political task, he added.

Wang was talking to a national financial work conference which closed yesterday. The 20-day conference discussed budget affairs for 1985. But no details were available.

Wang stressed that though the financial prospects for next year are good, spending increases should be kept under control.

The government is facing several tasks in the impending year. Hu Yaobang, general secretary of the party, has promised that wage increases will precede the price readjustments. This might be quite expensive for the government.

In addition, the country's finances will depend on a new tax system which went into effect in October. For the first time in more than 30 years, the economic relationship between the state and enterprises is fixed in the form of taxes. State-owned enterprises which used to hand in all their profits to the state now pay taxes and keep the after-tax profits. The state treasury is estimated to be facing an immediate loss of 3.5 billion yuan a year, but expecting a long-term return when enterprises use the after-tax money to expand production.

Wang admitted that there are factors which might affect state revenue and increase spending next year. But, he pointed out, the tax reform will provide stable sources of income to the state that will steadily increase. The technical updating of enterprises will result in higher productivity and, thus, more tax payments to the state. The Ministry of Finance is strengthening the management of tax affairs in the hopes that it will contribute to improving state finances.

The minister said he is confident that the financial task for next year will be fulfilled.

Besides the state budget, the minister said, there is a large pool of domestic funds which should be mobilized to finance the modernization programme. Nearly 100 billion yuan belongs to enterprises, institutes and various government offices, and another 80 billion yuan is held in rural capital. Put together, those funds are larger than the total annual state budget, estimated in 1984 to be 128.75 billion yuan.

The capital pool outside the state budget has increased significantly in recent years owing to economic reforms aimed at giving enterprises some financial leeway to operate. Agricultural policies encouraging rural people to get rich has boosted the accumulation of rural capital.

Wang said studies should be made to find out where this money is and how it is being spent. He suggested policy be worked out to divert this money to urgently needed projects.

In order to improve the state financial work, Wang said middle-aged and young people should be promoted to leading positions. Technical training for the staff should be strengthened. Next year, the Ministry of Finance plans to set up two training schools and to plan a national training center equipped with modern facilities.

CSO: 4020/51

FINANCE AND BANKING

LI CONGRATULATES NEW AUDITING, TAXATION BODIES

OW172138 Beijing XINHUA in English 1456 GMT 17 Dec 84

[Text] Beijing, 17 Dec (XINHUA)--China set up two national societies of auditing and taxation here in Beijing today.

In his letters of congratulations, President Li Xiannian said that auditing supervision is of great importance to the socialist legal system.

In accordance with China's constitution, the auditing administration was set up in September last year. In the past year or so, China has established more than 2,800 auditing offices above county level with a staff of 21,000. The offices have audited the financial affairs and management of more than 6,700 departments and enterprises across the country, and checked out a total sum of 1.9 billion yuan in various aspects, including 360 million yuan destined for state revenue.

Li said taxation was an important measure in regulating the country's economy. There are a lot of issues in this field which need to be studied, he said.

Addressing the auditing society, state councillor and minister of finance, Wang Bingqian, said that auditing offices at various levels should support and promote the current reform of the economic structure and the invigoration of enterprises, protect the legitimate rights and interests of the enterprises, supervise the enterprises in turning over their taxes and profits to the state and help them tap their potential, and improve management and economic benefits.

Wang Bingqian said, since China adopted a policy of replacing profit delivery with taxation its state revenue would mainly depend on taxation.

As the reform of the economic structure goes on in a comprehensive and in-depth way, Wang said, China would take effective measures to improve taxation work.

Both societies would carry out academic exchanges with their foreign counterparts, society officials said.

CSO: 4020/51

FINANCE AND BANKING

PRICE HIKE ON NEWSPAPERS

Guangzhou NANFANG RIBAO in Chinese 11 Oct 84 p 1

[News: "Three Newspapers in Guangzhou Raise Prices for Next Year"]

[Text] The Guangdong Provincial Department of Commodity Prices has approved a price increase for NANFANG RIBAO, YANGCHENG WANBAO and GUANGZHOU RIBAO from 4 fen to 5 fen, or 1.5 yuan per month starting 1 January 1985.

This price increase has come about mainly because of the price increase for newsprint in the last two years, which in turn led to higher costs for printing newspapers.

12715

CSO: 4006/65

FINANCE AND BANKING

PRICING OF AGRICULTURAL PRODUCTS

Beijing JINGJIXUE ZHOUBAO in Chinese 17 Sep 84 p 2

[Article: "A New Trend in Pricing of Agricultural Products in China"]

[Text] Agricultural production in our country is the most typical productive action using a densely concentrated labor force. The power consumed in agricultural production is mostly living power. Agricultural production before the year 1979 remained in a state of high expense, low efficiency and low results. This occurred not only because of the use of backward tools, but mostly because of the influence of the "leftist" policy, which dampened the enthusiasm of peasants. Although the cost of materials had risen constantly, yield rose very slowly and productivity remained constant.

After the Third Plenary Session of the 11th CPC Central Committee, this situation in agriculture started to change. Purchasing prices of agricultural products, production costs, the purchase and sale of products and byproducts and other aspects such as economic results--all underwent thorough and significant change.

1. The state procurement prices for agricultural products from peasants have changed spectacularly. At the beginning they increased by a large margin and then kept an even line. Considering the scope, variety and extent of increase, this change was unprecedented. It was a one-time readjustment that freely made use of the price lever. Since 1982 the prices remained relatively even and the negotiable prices of commodities also remained level and even came down slightly.

2. In the pricing of agricultural products there were more products sold above quotas at a higher price as well as more products with negotiable higher prices. Here the price lever in purchasing products played a larger role. This important change in state procurement prices was a result of developing agricultural production and also of social need. The greater part of products sold at higher price above quotas and those products sold at negotiable higher prices were also an important sign of growth in agricultural production. Although there are still problems, the balancing function of above-quota-higher prices and higher negotiable prices continues to be important and will play a larger role in the future.

3. Integration of price forms at various levels and partial market regulation played larger roles in purchasing and selling agricultural products. This improved the exchange of commodities between cities and countryside, encouraged diversified production in the countryside, and increased the peasants' earnings.

4. A significant change also took place in securing economic results for agriculture. The vigorous growth in agricultural production in recent years was an indication of the following fact: giving a free hand to utilizing price levers, the large increase in state procurement prices, and allowing for greater regulation by the market--these could be expected to cause an increase in production costs. But the result was that prices, instead of spiralling upwards, as had always happened in the past, now came down while production rose. The increasing production of grain and the diversified activities brought higher earnings to the peasants and great improvements in social and economic results.

12715
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FINANCE AND BANKING

COST VERSUS BENEFIT IN PRICING

Beijing JINGJIXUE ZHOUBAO in Chinese 17 Sep 84 p 2

[Article: "Cost Price and Social Benefit Price"]

[Text] Pricing is one of the weak links in the Soviet economy. Soviet economists, while summarizing the experience and lessons from the reform of wholesale prices of Soviet industrial products in 1966 and 1967, pointed out that because "cost prices" were determined according to the average production cost for the enterprises plus a certain profit, they do not reflect the consumers' evaluation of the products and cannot be dependable tools for measuring costs versus results. As a matter of fact, this kind of determination winks at low quality, at the production of undesirable products, and at restricting any possible increase in the production of beneficial products.

In order to solve this problem some economists hold that the base of pricing must be the social usefulness of the products. They maintain that in the socialist economy the interest of society does not depend on the use value itself, but on the use value suitable for specific social needs, that is for the social usefulness under given conditions. This is a common yardstick measuring social needs and social use.

Other economists believe that placing priority on either "cost price" or "social benefit price" is not correct. Both factors have identical importance, because if society does not consider the interests of producers and the price does not allow them to profit, they will refuse to produce. On the other hand, if society considers only the compensation of cost plus profit and does not pay attention to the social benefit and the scarcity of a given product, the pricing loses its ability to function as an economic lever. Therefore, for the sake of making prices satisfactory to producers and beneficial to consumers, society must establish an equilibrium between "cost prices" and "social benefit prices." "Cost price" is a lower-limit price; if a price is set lower than this limit, a producer would not get a proper profit. The "social benefit price" is an upper limit price that considers the whole benefit to the consumer (in comparison with a similar product or with a substitute). If the price is higher than this limit, the consumer will sustain a loss. A practical price level must arrive at a point between the "cost price" and the "social benefit price" that is acceptable to both producer and consumer.

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CSO: 4005/65

FINANCE AND BANKING

BRIEFS

GOLD, SILVER COINS ISSUED--Beijing, 14 Dec (XINHUA)--The People's Bank of China issued a gold and a silver coin today to mark the Chinese lunar year of the ox, 1985. The coins bear depictions of the marble boat in the Summer Palace in Beijing on the obverse, and an ox from the five-oxen painting by Han Huang, a noted artist of the Tang Dynasty (618-907), on the reverse. The eight-gram gold coin measures 23 mm in diameter and contains 91.6 percent gold, while the 15-gram silver coin measures 33 mm in diameter and contains 90 percent silver. The coins were minted by the China Mint Company; the overseas sales agent is the Peking Coin Company Ltd. of Hong Kong. According to the lunar calendar, 12 years, each represented by an animal, constitute a cycle. Previously, the People's Bank had issued cock, dog, pig and rat coins. [Text] [Beijing XINHUA in English 1051 GMT 14 Dec 84]

NATIONAL TREASURY BONDS TARGET--The 1984 national treasury bond target has been passed, the Ministry of Finance announced on Wednesday. By the end of last month, government and public organizations and individuals throughout China had purchased more than 4.11 billion yuan's (about \$1.48 billion) worth of treasury bonds, outstripping the planned target by 2.9 percent. The annual interest rate is 8 per cent on treasury bonds bought by individuals and four per cent on those bought by units. The sale of treasury bonds valued at four billion yuan a year from 1981 until 1985 is aimed at supplementing state revenues to fund China's modernization. [Text] [Beijing CHINA DAILY in English 15 Dec 84 p 3]

CSO: 4020/51

MINERAL RESOURCES

RICH TIN DEPOSITS IN GUANGDONG PROVINCE

Beijing ZHONGGUO DIZHI [CHINA GEOLOGY] in Chinese No 5, 1984 pp 25-26

[Article by Xu Jiapeng [6079 1367 2590], Liang Yuehao [2733 1878 6275] and Wang Zhenhai [3769 2182 3189]

[Text] Guangdong Province is rich in tin deposits, ranking fourth in tin reserves in the entire nation. Reserves in primary grade tin ores make up most of the deposits. The distribution of tin ores is generally as follows: in the south of eastern Guangdong's Lianhuashan north-easterly fault, mainly cassiterite-sulphide type tin ores; between Heyuan and Lianhuashan faults, mostly cassiterite-quartz vein type tin ores; northern Guangdong's east-westerly tectonic zone, mostly tungsten-tin quartz vein type and skarn type tin ores. Alluvial tin ores are chiefly found in eastern and western Guangdong.

I. Types of Deposits

(I) Skarn type tin deposits. The proved reserves make up over 10 percent of the total deposits. This type is divided into two sub-categories according to the ore and minerals:

1. Skarn type ferrian-cassiterite ores are chiefly found in areas where the upper Paleozoic group clastic rocks sandwiched with carbonate rocks come into contact with the Yanshan third period granite rocks. They mostly appear along the contact areas or along the layers.

2. Skarn type tin ores -- mostly metal ores. Mostly appear in the areas where the upper Paleozoic group, part of Mesozoic group carbonate rocks and Yanshan the third period granite rocks come into contact.

(II) Sulphide type tin ores. Mostly found in surface metamorphic arenaceous shale, especially in the arenaceous shale of Lower Jurassic series. This is high and medium temperature hydrothermal filling and replacement ores. The proved reserves make up over 1/3 of the total deposits.

(III) Quartz vein type tin ores. Mostly found in the interior and exterior areas where pre-Devonian system and Jurassic system clastic rocks come into contact with Yanshan the third period and the fourth period granite rocks. This is high and medium temperature hydrothermal filled ores. The proved reserves make up close to 1/3 of the total deposits.

(IV) Alluvial Tin ores. Mostly alluvial type with a small amount of slope wash, eluvial and mountainfoot accumulation type in it. The proved reserves make up approximately 1/6 of the total deposits. Besides, there are granite rock type tin ores, gresin type tin ores, porphyritic rock type tin ores and pegmatic rock type tin ores. Of these, porphyritic rock type tin ores are proved to be relatively prospective for exploration from the fact that they have good outcome in the geological evaluation work carried out in recent years. The rest of them are mostly medium or small deposits whose reserves are proved to be very little.

II. Prospects of Exploration

(I) Direction for exploration: the basic peculiarities on the overall geological structure of the province are: based on the Xinhuxia group tectonics and the east-westerly tectonic zone, it is divided into six class III mineralogenetic tin zones, and then according to the distribution of ores, mine location, heavy stream tin and geochemical exploration anomalies, the distribution of the tectonic magmatic rock areas as well as layers, types of rocks and other conditions divide still further into 14 areas in the class IV mineralogenetic prospecting areas. They are divided up concretely according to the chart below:

1. Regional tectonic characteristics, magma conditions. Judging from the geologic peculiarities of the tin ores of the entire province, the invasive movements of Yanshan period granite is the crucial factor controlling tin ores. Yanshan period acidic magmat has, principally along two major axes, the east-west and the north-south minable areas to be distributed along these axes. Where fracture or fold zones, meeting along these two axes accompany the production of rock bodies which invaded the area during the Yanshan period ores and deposits are usually very abundant, the types of ores are very numerous and they have excellent prospects for exploitation. Take for example, the Yaoling-Jubankeng, Changpu-Xiling mineralogenetic prospecting area. Places where the east-west tectonic belt and the Xinhuxia group tectonic belt meet together often determine the distribution of mineralogenetic prospecting areas. As, for example, the Dading, Houpoao and Paitan-Lishan and other mineralogenetic prospecting areas.

2. Strata and rock conditions. When the structure and movement of the magmatic rocks are favorable to mineralization, different types of ores are associated with a particular stratum. Skarn tin ores are principally produced in strata of the Devonian-Triassic periods; sulphide-quartz tin ores are principally produced in the clastic rocks of the lower Paleozoic group and the Upper Triassic series- Lower Jurassic series; sulphide-type tin ores are principally produced in the clastic rocks of the Lower Jurassic series. The most important types of Yanshan period magmatic rocks related to the formation of tin deposits are granite, followed by granite-porphyries and quartz-porphyries.

3. Prospects of different types of deposits.

Cassiterite-sulphide deposits are the most important type of deposit found in the province. It is produced in many areas; it is widely distributed, usually of fairly high quality and its proven reserves are the greatest. It is principally distributed to east coastal Guangdong, usually in tin deposits containing lead, zinc and other metals as well. It is one of the principal objects of prospecting efforts. Cassiterite-quartz vein deposits are second only to cassiterite-sulphide in proven reserves. They are usually found in medium and small deposits, along with some larger ones, thereby making it one of the most important types of tin deposit found in the province. It has a relatively good outlook for prospecting. There are some reserves of tin sands and skarn which are of some interest for prospecting. In the last few years there have been some developments in porphyries. It is now believed that Xinyi's Yinyan and Lufend Tashan tin ores which are relatively large and have good prospects are porphyry type deposits.

(II) Resource outlook: according to mineralogenetic and geologic peculiarities, mining production, and the distribution of tailings and geochemical exploration anomalies, etc. tin deposit prospecting areas are divided into three types, A, B and C. Type A has a good outlook for prospecting, for example IV₃, IV₁₃; Type B has a fairly good outlook for prospecting, for example IV₁, IV₄, IV₆, IV₈, IV₉, IV₁₁, IV₁₂; Type C is just suitable for prospecting, for example, IV₂, IV₅, IV₇, IV₁₀, IV₁₄. Excluding the mineral ores, there are over 300 deposits which have an excellent outlook. According to the method of statistical comparisons, 38 of these deposits have mining prospects when estimated at the 8 percent probability of discovery. This is roughly comparable to the 35 tin beds that have been discovered so far in the province. Therefore we can predict if we carry out the corresponding amount of proven reserves.

Due to difficulties in selective melting, low quality products and complicated conditions of exploitation, the province's surface tin reserves is relatively large, exceeding the accumulated proven underground reserves. Once a breakthrough is made in the problem of recovering selective meltings such a large quantity of surface reserves will become reserves with good prospects. This will be a very great development in the exploitation and use of tin resources. While the province was developing a 1:200,000 regional geologic survey, a 1:200,000 measurements for tailings in the river and metal content in the soil was carried out. Practice has proved that these two methods are very effective in searching for tin deposits.

On the 1:200,000 riverine tailings survey map there were 319 cassiterite and tailings coronal abnormalities. Within 142 of these corona tungsten-tin deposits were discovered. On the 1:200,000 composite map of metal content in soil there were elemental tin abnormalities in 415 places, at an average concentration of 75ppm, three to six times that of the 12-25ppm abundance value of Nanling's Yanshan period granitic tin. There are 191 deposits comparable to Class I and II abnormalities, averaging 80ppm, all suitable for prospecting. Advantageous for prospecting are those mineralogenetic regions in which Yanshan period granitic rocks are distributed, since these rocks had a part in the formation of the tin ore deposits. In the 14 mineralogenetic areas for prospecting already defined mineral ores, deposits, tailings, geochemical exploration and chemically determined coronal abnormalities can be seen very often. This shows that Guangdong's Province's tin deposits have excellent prospects.

MINERAL RESOURCES

GOLD MINING ENCOURAGED IN GUANGDONG PROVINCE

Guangzhou NANFANG RIBAO in Chinese 19 Oct 84 p 1

[Article: "Guangdong Province Fulfills Gold Production Plan for 1984 Ahead of Schedule: Policy of Making People Better Off Promoted, Masses Encouraged to Mine Gold"]

[Text] In recent years in Guangdong Province an unprecedented gold mining craze has taken place. Statistics show that more than 50 places in Guangdong had reserves and a great number of households have been specializing in work there. By the end of September 1984 Guangdong has produced 196,500 grams of gold and the planned production increased by 3-fold over the same period last year.

In this year's mass gold mining campaign the provincial gold department made a general propaganda of the party's policy of enriching the people thereby encouraging the households to mine further; it also sent specialists to the mining places to help residents determine the location of gold reserves and to improve their mining tools and technique. Owing to these measures gold production quickly increased. In Zhaoqing Prefecture, which is known as "the house of Guangdong gold", the number of miners was about 2,000 more than last year. The prefecture fulfilled its gold marketing plan four months ahead of schedule. Recently some miners discovered a rich new mining area at the top of Taiping Mountain. The mineral grade there is 20 percent higher than the usual industrial level.

Guangdong Province has many resources of nonferrous metals. Gold and silver are often found in association with them. This presents a favorable prospect for miners. A great number of smelters and ore dressing plants have extracted a measurable quantity of gold and silver as byproducts. For instance, every year the Shaoshan Smelter extracts and turns over to the state approximately one kilogram of gold while smelting lead and zinc.

12715
CSO: 4006/65

INDUSTRY

LIAONING DEVELOPS LIGHT INDUSTRIES

Shenyang LIAONING RIBAO in Chinese 24 Jan 84 p 2

[Article: "The Light, Textile, and Electronics Industries Being Developed in Liaoning Province"]

[Text] Dantong is not only known in China and abroad for its scenic surroundings but also renowned for its electronic products. Many people who have never been to Dantong have come to love that city because of its fine products such as toothpaste, silk dresses and wrist watches.

Dantong has made relatively big strides in developing light, textile and electronic industries. In addition to its traditional products like paper-making and silk textiles, it has developed new light industrial products comprising electronic devices, wrist watches, fountain pens, cameras, and so forth. At present, there are over 1,300 enterprises throughout the city, with a huge contingent of more than 200,000 textile and other factory workers doing their jobs selflessly for the people's better living conditions. Last year, the city's gross industrial output value reached 18 billion yuan, an increase of 6.2 percent over that of the preceding year. This was equivalent to 30 times greater than that of the initial period of liberation. By proportion, light and textile industries make up 72.5 percent of all the city's industries.

The key to Dantong's thriving industrial development lies in reform. In former years, Dantong was known as Dashahezi. In the early years of liberation, the so-called industrial undertakings there consisted of nothing but several blacksmith shops, stores selling thin metal sheets, vendors of silk piecegoods and a number of obsolete machines. After the people of Dantong have struggled for over 30 years, the city has changed. By far the greatest changes occurred in the years since the Third Plenary Session of the Eleventh CPC Central Committee met. Toward the end of 1979, Dantong proposed learning from Changzhou with an innovative spirit in order to rapidly build up the city into a modern industrial town. Bold steps were taken throughout the city to adjust industrial production by eliminating a number of "languishing" enterprises and making adjustment to a number of products having long-term prospects. Vigorous efforts were made to conduct scientific research with domestic and international advanced levels in mind and to tackle key problems while paying attention to improving production techniques, upgrading quality, promoting better new products and introducing more patterns and greater varieties.

In 3 years over 900 new products, more than 3,400 latest designs and hundreds of textile and electronic products became available throughout the city to gain popularity in China and abroad. Since a number of segments in the production relations that had hindered the development of productivity were adjusted, the initiative of both enterprises and workers was greatly mobilized to promote the development of light, textile and electronic industries. At the same time, a large number of brave, reform-minded and path-breaking pragmatists, intellectuals and leading cadres appeared. Farsighted and undaunted by difficulties, they joined the people of the entire city in the four modernizations drive, contributing significantly to the development of Dantong's light, textile and electronic industries. Early last year, the Dantong Electronics Industry Company initiated and ushered in a new phase of reform, becoming the first in Liaoning province to win the citation of "doubling the profit tax in 3 years and obtaining silver medals for more than two categories of products." This brought about strong reactions. Working energetically for 1 year, the company's staff and workers netted profits amounting to over 18 million yuan, thus achieving ahead of schedule the plan of doubling the company's profits. At present, the experience gained by that company has been publicized throughout the city. The Dantong Wrist Watch Manufacturing Company remained a watch repair shop in the early years of liberation. Through the efforts of the company's staff to persist in reform and to boldly introduce innovative approaches since 1979, the annual output of wrist watches has on the average gone up by 23.9 percent, with profits going up by over 30 percent. As a result, the company has become China's second wrist watch production base employing some 10,000 workers. Over 5,400 kinds of light, textile and electronic products became available throughout the city last year, with five products including television sets, tuners and silk fabrics awarded national silver medals. Moreover, 38 products were cited for superior quality by the Ministry of Light Industry and Liaoning Province. Among new products that are still in the stage of trial manufacture or are ready for production, 45 of them have reached or are approaching advanced levels in China and abroad. Dantong is thus becoming a fledging industrial city boasting modern light, textile and electronic industries.

12661
CSO: 4013/159

INDUSTRY

YUNNAN DEVELOPS ELECTRONICS INDUSTRY

Kunming YUNNAN RIBAO in Chinese 25 Feb 84 p 2

[Article Su Wenjiang [5685 2429 3068]: "Actively and Cautiously Develop the Electronics Industry in Yunnan"]

[Text] At present, a new industrial revolution has been widely discussed in China and abroad. In this revolution a number of new technologies will be rapidly developed. Of these, the electronics technology and particularly the microelectronics technology will play a leading role. To keep pace with the new trend, Yunnan's electronics industry should make big strides by equipping national economic departments with the microelectronics technology in order to promote technological advances and the development of productivity. In developing the electronics industry, Yunnan already has these four favorable conditions: First, after striving hard for 15 years, we have made something out of nothing by developing small projects into larger ones. At present, there are 23 electronics enterprises in Yunnan that are initially capable of producing small, reinforced calculators, miniaturized calculators and veneer machines, communications equipment, instruments and meters, television sets, cassette recorders, electro-vacuum and semi-conductor devices, silicon and solar energy batteries, energy saving electronic products and other new industrial products utilizing electronic applications. Some of these products have attained advanced levels in China while others have received national and provincial awards for innovative approaches to product and excellence and for achieving scientific and technological breakthroughs. Second, the emergence of a technological contingent. Of more than 7,600 workers employed by the whole system, technical personnel make up 17.7 percent, a proportion higher than that specified by the Ministry of Electronics Industry. Third, Yunnan's natural conditions are suitable for developing the electronics industry, without the need for the installation of thermostats as required in certain provinces. Four, the importance attached by provincial party committees and provincial governments. Leading and responsible comrades of provincial party committees and provincial governments left us specific instructions before and after the spring festival after they had heard our summary reports, research and development plans on three separate occasions. With these favorable conditions, Yunnan has been able to overcome by stages such unfavorable factors as poor industrial foundations for the development of electronics, inadequate technological forces and tardy overhaul of equipment. As a result, fairly rapid development

has been achieved. We should carry forward the spirit of hard struggle and relying on our own efforts, continue to implement the guiding principles of stressing readjustment, reform, reorganization and consolidation and focus on raising economic results, laying foundations, tapping potentials, tackling management, increasing product variety, upgrading quality and blazing a new trail in the accelerated development of the electronics industry.

In determining the direction and scope of development for Yunnan's electronics industry, we should proceed from the actual conditions of the country as a whole, particularly from Yunnan's, with vigor and caution. We should avoid trailing behind others if electronic products available all over the country are assured of adequate supply for the market. We should actively provide such products that are not assured of supply at all, especially if they will be in great demand in the long run. We should create conditions for supplying those products that are not available in the country but which are needed in Yunnan. We should actively develop the consumer-oriented type of electronic products and speed up the coordinated development of electronic components. Our preliminary plans based on 1980 production figures are to triple the output in 1985. Beginning with the Seventh 5-Year Plan, we should strive to double the output every 4 years. To achieve this plan, we should depend on policy and on scientific and technological advances.

In particular, we should value highly the present fine moment by making technological advances in bigger strides. This year we should aim at upgrading quality, introducing new varieties of products and reducing loss through wear and tear. On the basis of consolidating enterprises, we should strengthen technological innovations, vigorously tackle technological transformation and the introduction of technologies in order to promote technological management and improve technological services. We should handle properly and in separate ways the work of bringing in the assembly line method of producing electronic calculators and color television sets as well as key equipment so that mass production capacity can be attained as speedily as possible.

The workers and staff of Yunnan's electronic products departments, particularly the vast number of party members and cadres, should take note of the fine prospects, cherish the electronics industry and advance unceasingly with great vigor and undaunted by difficulties. With this spirit and working in a down-to-earth manner, Yunnan's electronics industry can surely expect the coming of a promising period of big development.

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CSO: 4013/159

FOREIGN TRADE AND INVESTMENT

REFORMING CALCULATIONS OF CIF, FOB TO PROMOTE TRADE

Beijing GUOJI MAOYI WENTI [INTERNATIONAL TRADE JOURNAL] in Chinese No 5, Sep-Oct 84 pp 55-56

[Article by Wang Li [3769 3863]: "Reform Methods for Calculating and Paying Commissions To Promote Exports, Increase Foreign Exchange Revenue"]

[Text] Currently, the "commission fee" we use for the export of a few machinery and electronics products is used on 60 percent of all exports. Thus, how we calculate the commission directly affects the foreign exchange revenue of our side. According to the usual practices of international trade, the commission is calculated using the F.O.B. [freight on board] price as a base, that is, the commission equals the F.O.B. price multiplied by the rate of commission. For example, if the F.O.B. price is \$1,000 and the rate of commission agreed upon by both sides is 5 percent, then the commission is: \$1,000 times 5 percent, or \$50. This method for calculating the commission is widely used in international trade.

In most deals involving China's exports of machinery and electronics products the C.I.F. [cost, insurance and freight] price or the cost and freight price is used to conclude the transaction. In export contracts, the commission is generally calculated on the basis of a "package price." For example, for 5 percent C.I.F. on \$5,000, the commission would be: \$5,000 times 5 percent, or \$250. These are two problems with this method calculating the commission.

1. The commission is calculated and paid according to a fixed commission rate, and sales agents receive a "double commission."
2. Even insurance and freight are included in the commission.

The aforementioned method for calculating and paying commissions is incorrect because:

1. The "double commission" paid by the seller is unfair and unreasonable and is also unique in international trade.
2. A sales agent can only propose a commission from the profits from the payment for goods by our side and cannot propose a commission from the freight

and insurance fees. Because freight and insurance fees are earned by the shipping company and the insurance company, respectively, the commission should not come from the earnings from our side.

For many years, because we have used the incorrect method of calculating and paying commissions, we have suffered significant foreign exchange losses. According to incomplete statistics, our foreign exchange losses from 1978 to 1983 from the export of only one type of machinery product to five regions and countries are as follows:

Our foreign exchange losses from calculating and paying a "double commission" (in \$10,000):

	Total C.I.F.	Commis- sion	Net C.I.F.	Commission per net C.I.F.	Double Commission that that our side must pay
Total	10,135	735	9,400	682	53
Hong Kong	5,593	419	5,174	388	31
Singapore	2,496	174	2,322	162	12
Malaysia	1,173	82	1,091	76	6
Thailand	514	35	479	33	2
Philippines	359	25	334	23	2

2. Foreign exchange losses from commissions given to businessmen for insurance and freight fees (in \$10,000):

	Insurance and Freight	Commission Rate	Total Commission
Total	432		30.6
Hong Kong	200	7.5%	15
Singapore	132	7 %	9
Malaysia	62	7 %	4
Thailand	22	7 %	1.5
Philippines	16	7 %	1.1

This machinery product is exported to 66 regions and countries, and the foreign exchange losses by our side are considerable. Yet this long-drawn-out problem has never attracted any attention and to this date has not been solved. A few people feel that sales agents have been receiving commissions from us for more than 20 years, that if we change the method of calculating and paying commissions, their income will be reduced and will affect their enthusiasm for marketing our products. This view does not jive with reality. Because sales agents receive a larger commission the more that they sell our goods, they do not need to demand additional income from commissions from us; and because our method of calculating commissions is incorrect, we pay them. We must present the facts and reason things out with the sales agents and must patiently persuade them. Because the methods used in international trade customs to calculate and pay commissions are fair and reasonable, sales agents have no reason to refuse. There are also people who feel that if we change the method of calculating and paying commissions

to listing costs in the contract separately for the payment for the goods, for the insurance fee and for the freight fee, we can then calculate and pay the commission using the F.O.B. price as a basis; this way there are certain difficulties and the volume of work for making appraisals and drawing up contracts is increased. This view is one-sided and does not view the situation in terms of economic results. Insurance and freight fees in export contracts can be calculated according to the normal price for different commodities as stipulated by insurance companies and transportation companies, and foreign exchange is settled according to the actual amount of money and insurance and shipping companies (it is always settled this way in actual business).

Some leaders have not paid enough attention to reforming the methods for calculating and paying commissions and they lack resolve. Yet we need only to resolutely analyze how foreign importers and exporters calculate and pay commissions to be able to strengthen our conviction in reform. Below as an example is the spiral bevel level exported by the United States to Thailand.

NO. 645 HYPOID GENERATOR (CODE WORD "DESMA") WITH STANDARD EQUIPMENT

F.O.B. Rochester NY, USA	\$526,000
Less 2% Commission to Buyer	<u>10,520</u>
Net F.O.B. Rochester	515,480
+Shipping Charges to	
F.O.B. Vessel New York	3,575
+Insurance	3,576
+Freight	<u>91,944</u>
Total Net C.I.F. Bangkok	\$614,575

The above buyer subtracted the transportation expense for shipping the product from the factory location in Rochester to New York Harbor and calculated and paid the commission on this basis. This method for calculating and paying commissions has already been thoroughly worked out to the point that transportation in the interior of the country is not subtracted from the buyer's profit. When again calculating and paying the commission, this is fair and reasonable for the sales agent, it stresses economic results for the buyer, and compared to our method of calculating and paying commission on the basis of "a package price," it illustrates even more clearly that our work is not meticulous and earnest enough and that our method causes the state undeserved losses.

The significance of correctly calculating and paying commissions is not limited to the above analysis. We can also encourage sales agents to enthusiastically market our goods and thereby promote our exports. For example, we can raise the sales agent's commission when he is selling unmarketable goods, and we can use discretion for hot-selling goods. In short, with regard to commodities, on different markets and on the same markets at the different times we must use different commission rates so as to encourage sales agents to enthusiastically market our goods.

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FOREIGN TRADE AND INVESTMENT

TRANSFERRING EXPORT GOODS FOR SALE ON THE DOMESTIC MARKET

Beijing GUOJI MAOYI WENTI [INTERNATIONAL TRADE JOURNAL] in Chinese No 5, Sep-Oct 84 pp 62-63

[Article by Liu Aiming [0491 1947 2494] of the Jiangsu Light Industry Products Import-Export Company: "Suggestions for Classifying and Managing Prices for Export Goods That Have Been Transferred for Sale on the Domestic Market"]

[Text] With the increase in the volume of export business and the ever-changing international market, foreign trade companies will often have a few products unsuitable for sale abroad that must be transferred to the domestic market for sale. For most special export companies, transferring export goods for sale on the domestic market is no longer temporary work.

Transferring goods for sale on the domestic market is important work that foreign trade companies should competently manage and administrate. Vigorously organizing the transfer of unmarketable goods from the foreign to the domestic market can both reduce the overstocked goods of foreign trade enterprises and enrich the domestic market.

At present, however, there are a number of goods that foreign trade departments wish to transfer to the domestic market but cannot, or they make slow progress, and domestic trade departments want to sell them but are unable. There are of course many reasons for this, but the pricing of export goods that are transferred for sale on the domestic market is a factor that cannot be ignored.

Currently, a large number of foreign trade departments are using one price for the export goods transferred to the domestic market no matter how large or small the batch is and no matter what the sales targets are. This has affected the enthusiasm of the commercial departments for dealing with the export goods transferred to the domestic market. At the same time it has also disrupted the market, and similar goods from similar sources are selling at different prices. Thus, a number of people are compelled to use every possible means to purchase export goods that have been transferred for sale on the domestic market directly from foreign trade companies (profits and taxes have already been added to sales by commercial departments). With regard to foreign trade departments themselves, since sales targets are

different, even if the sales price is the same in form, owing to the influence of taxes, sales costs and other factors, the actual revenue is different. Because for some goods there is no difference between the commercial wholesale price and the retail price, they might as well be overstocked in warehouses, and some sales by foreign trade departments have seriously hindered progress in transferring export goods for sale on the domestic market.

How do we solve this problem? Some companies and localities stipulate that export goods transferred for sale on the domestic market without exception will not be permitted to be sold to workers or individuals, and will especially not be permitted to be sold to individual vendors. I feel that this type of passive measure is insufficient.

Sales of export goods transferred to the domestic market must be completed making as much use as possible of domestic commercial organizations, and without a doubt the organizations should handle the marketing. Yet this does not mean that they have to handle every commodity. Domestic consumers do not understand and are not keen for a few export goods that have been transferred for sale on the domestic market. Commercial departments still make inaccurate quotations for the sales of certain goods, and there is no assurance that they will have the goods in stock. Thus, fully utilizing many channels for sales can have the effect of widely publicizing sales. Individual retailers, individuals, and groups of consumers make fairly ideal sales targets; even though their buying power is not great, they can serve to widely publicize sales. We must strive to advocate wholesale sales to individual retailers, and we can also appropriately sell some goods at retail prices to groups of consumers and individuals (this can be determined based on the specific circumstances of each locality and each company).

We must further improve our management methods in using many sales channels, especially the management of prices, and we must use different prices based on the different purchasing targets. Within the limits of the prices approved by higher levels (approval departments only approve prices at the very lowest limits), we should use wholesale prices for state-run or collective enterprises, and prices for large and small quantities can be appropriately comprehended and a distinction can be made so as to encourage orders for large quantities. On this foundation, we can implement the method of adding an industrial and commercial tax on the wholesale price of individual retailers, and then adding the industrial and commercial tax on the wholesale price. The industrial and commercial tax is calculated by multiplying the retail price by 3 percent, and the commercial wholesale price and retail price can be calculated according to a 10 percent price difference. The formula for this computation is:

The wholesale price of individual retailers equals wholesale price +
wholesale price $\frac{1}{1 - 10\%} \times 3\%$, which can be abbreviated as: the wholesale price
times 1.0333 equals the sales price for individual retailers.

As for the retail price for individuals and groups of consumers, the difference between the wholesale and retail price must be added to the wholesale price. The formula for this computation is:

The sales price for individuals and groups of consumers equals $\frac{\text{wholesale price}}{1-10\%}$, which can be shortened to: the wholesale price times 1.111.

If we can classify and manage the prices of export goods for sale on the domestic market, we can fully arouse the enthusiasm of commercial departments and individual retailers to manage and can limit the sporadic foreign trade purchases made directly by individuals and groups of consumers. We can thus meet the needs of price management and market management, and foreign trade departments will not suffer reduced income because of different sales targets.

After carrying out this method, the industrial and commercial tax that the foreign trade departments must pay will use the total sales volume minus the sales volume of commercial departments as a base, and this will be multiplied by the industrial and commercial tax rate.

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DEVELOPMENT STRATEGY FOR FOREIGN TRADE IN ELECTRONICS

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[Article by Ge Zhangi [5514 7022 5030] and Ge Being [5514 0365]: "A Discussion of the Countermeasures of the World's New Technological Revolution and the Foreign Trade of China's Electronics Industry"]

[Excerpts] In the world's new technological revolution, the rapid development of electronics technology is bringing with it a new and developing industry and is vigorously making a run at the electronics industries of all nations, and it has already started to cause far-reaching and profound changes in the world's economic and social well-being. The field of international trade is the first to be affected by this; thus, we must give this problem our full attention, resolutely implement the CPC Central Committee's open-door policy, place ourselves in the international division of labor of the electronics industry, closely integrate the development of this international industry with international trade, use new technical equipment, vigorously develop the electronics industry and promote the "four modernizations."

II. The Current Situation of Foreign Trade in China's Electronics Industry

Electronics technology is an industry that relates to all fields in social economics and livelihood and possesses a strong permeability and international character. How strongly electronics products can suit capabilities on the international market is an important sign of the economic and technological levels of a nation. China's base for exporting electronics products is substandard, and it is only in the past few years that the industry has advanced fairly quickly. In 1983, the total value of exports increased 55.6 percent compared to the year before, and this amounted to only \$640,000, or 0.3 percent of China's total value of exports and 1.14 percent of the gross output value of the electronics industry. In the past, the main exports of the electronics industry were pocket-size radios, electronics components and other special materials. In the past 2 years, China has started to export televisions, anion generators and other home appliances as well as "single boards," Chinese-character terminals and other microcomputers and peripherals. Computer-controlled

filament-cutting machines and other special equipment have started to enter the international market. There are still few exports of products with sophisticated technology, and there are a lot of gaps. We are still in an extremely backward position on the international electronics commodity market and we have not yet caught up to South Korea, Singapore, Hong Kong and Taiwan. This does not suit the position of such a large country as China. We must both import and export a great deal. We can then use the results of the new technological revolution, and this seems to be an important strategy for quickly developing the electronics technology. The volume of imports of electronics products by many advanced nations also holds a significant proportion. With regard to the total volume of electronics products imported in 1981, U.S. imports were 103.8 times larger than China's, West Germany's were 45.5 times greater and Japan's were 14 times greater. This kind of backward situation in the foreign trade of China's electronics industry is mainly caused by the country being closed to international intercourse and cut off from the world for a long time. Premier Zhou Enlai criticized the "traditional conservatism" of the electronics industry. It was deeply affected by "leftist" ideology, and it stopped the entry of imports in the name of "self-reliance," "national production" and "safeguarding the industry of the people." The electronics industry would not allow new technology, new equipment, new products and new advanced management techniques to be imported. The scientific and technological achievements jointly created by the people could not be enjoyed, and the gap became greater and greater.

III. Countermeasures for the Foreign Trade of China's Electronics Industry

Under the new circumstances of giant strides being taken in the worldwide electronics and technological revolution, paying attention to the development of the foreign trade of the electronics industry has already become a strategic task for promoting China's electronics and technological developments; promoting the technological transformations of other industries, raising economic results and accelerating the four modernizations.

Since the 3d Plenum of the 11th CPC Central Committee, the Central Committee has proposed the policies of stimulating the economy domestically, opening up to the outside world and facing the outside world in a unified manner. Recently it took another step forward in making a strategic policy decision to open up 14 coastal ports. This was a new turning point in the history of China's foreign economic trade relations and terminated China's long-standing seclusion. The Central Committee has opened wide the gate for our open-door policy, has pointed the way forward, has opened up a new prospect for economic development and has placed the development of China in an international environment. Our task is to eliminate "leftist" influences, resolutely implement the Central Committee's open-door policy, adopt effective countermeasures, welcome the challenge and catch up to the advanced world level.

(1) The foreign-trade system of the electronics industry must be restructured as quickly as possible. The two great tasks of opening up to the outside world and restructuring the system must be carried out simultaneously. Only with an advanced system can we ensure a better open-door policy, thereby accelerating the use of foreign capital, the importation of advanced technology and the joint operation of enterprises, enabling a large number of products to enter the international market and vigorously developing our economy. The foreign trade of China's electronics industry is an independently managed, centralized system and does not meet the needs of the new situation of the open-door policy. This backward system mainly makes a division between foreign trade and production, causes production to be divorced from marketing and cuts off the connection among producers, users and the international market. With regard to the changes in supply and demand on the international market, information on new technology and new products is not up to date and our responses have not been sensitive. We are unable to accelerate the pace of promoting the technology of enterprises effectively, and export products are "made all the same" and do not have much of an ability to meet needs on the international market. Thus, we must restructure in the following few ways: 1) we must establish a foreign-trade corporation under the Ministry of the Electronics Industry and unify the leadership of each port and each special import-export company. We must unify our management for dealing with the outside world and should not "cut prices to sell competitively abroad" for the sake of "gaining a competitive edge." 2) We should establish jointly run industrial and commercial import-export companies at ports. Production enterprises and import-export companies should combine to become economic entities and should be jointly managed. 3) We should use major specialized trade as the main body for establishing all types of jointly run specialized foreign-trade companies, such as in computers, special electronics materials and electronics communications systems engineering. 4) The aforementioned jointly run foreign-trade companies must have the participation of scientific research units, and within the integrated body they should achieve an organic synthesis of scientific research, design, production and management. We must strive to achieve three changes in the restructuring of the foreign-trade system of the electronics industry. First, we must change from having a sealed-off mechanism to having an open mechanism. If we stop being sealed against foreign trade, scientific research and production and if we open up, we can then all enjoy the conditions created from the new results of technology. Second, we must change from a centralized to a decentralized mechanism. Delegating power to lower levels helps to arouse extensive enthusiasm and creativity in foreign trade, scientific research and production and to promote technological advances, develop production and expand the supply of export goods. Third, we must change from merely having a foreign-trade mechanism to a management-production-scientific research mechanism. Having an organic synthesis of the three mechanisms helps to take new foreign technology and new products directly, digest and create, catch up with the international market and open up the international market.

(2) We must actively become involved in the system of the international division of labor and carry out an "opportunistic" strategy. "Science and technology are riches jointly created by mankind." Comrade Deng Xiaoping pointed out: "We study advanced technology, science and management to serve socialism, but these things do not by themselves have a class character." We must "quickly master the world's newest science and technology." In order to catch up to advanced nations, we must be "opportunistic" toward all the world's advanced science and technology and its management and administrative methods. We must integrate our national conditions to digest, transform, and create new products rich in the Chinese flavor and besides, for meeting domestic needs, we must face the international market and dare to compete with the electronics products of major industrialized and technical nations. This requires that we first overcome "leftist" influences, liberate our thinking, dare to be "opportunistic," not be afraid of being ridiculed and not be afraid of defeat and that we do not duplicate work that people have already performed successfully in developing new technology and new products. At the same time, we must initiate original and creative research in the realm of new technology, develop new products for export and raise our competitive capability. Under the ideological guidance of the aforementioned development strategy, strategic measures for the foreign trade of the electronics industry are as follows:

1. There must be a measure in taking the shortcut of "opportunism," and we can then double our results with half the effort. First, we must unify leadership, adopt legislative measures, unify our planning, stipulate a jurisdiction for examining and approving projects that are imported and guard against blindly importing and duplicating imports (the level of duplication is mastered by the Ministry of the Electronics Industry). Second, we should generally import advanced technology and import fewer complete sets of equipment. Third, we should combine imports with creativity and cause imported technology to melt into our electronics technology system; this will be embodied in the rapid export of new products and improved economic results. Fourth, we must regard the digestion, development and use of new technology, new materials, new equipment, new products, new sales and new management methods as an organic whole, and we must synthesize scientific research, production and foreign trade and simultaneously coordinate and mutually promote them. Fifth, we must give the same priority to training personnel and exploiting intelligence as we give to importing technology, and we must conscientiously emphasize technical training and taking classes so as to establish superior intelligence resources and to help strengthen our capability for self-reliance.
2. Importation of electronics technology accelerates the narrowing of gaps in industrialization and in information. We must rely on technological advances to develop the economy vigorously. Not only has electronics technology first been developed and strengthened in the information processes of the society and the economy, but it must be broadly applied in every field, produce a vast number of social and economic results, greatly raise the quality and quantity of industrial and agricultural products, reduce costs and be strongly suitable and competitive on the

international market. Accelerating the transformation of the industry's electronics technology is an urgent matter. We must cooperate on research and development with all industrial departments, plan as a whole, centralize investment, import electronics, communications, control and other systems engineering technology and necessary electronics equipment and achieve the industrialization of electronics. In order to develop and import information technology, we must spread its use, develop the information economy, establish an outstanding industrial base and simultaneously narrow the two gaps.

3. Importing advanced technology raises the level of dependence of the electronics industry on the international market and raises the rate of the contribution of exports. In the past there was a saying: China has a large population, vast land and a large market, so there is no need to worry about products being able to sell, and we do not have to rely on the international market. This type of small-scale peasant economic ideology inhibits the development of the foreign trade of the electronics industry. For many years, the export of traditional products that were "all made the same" lost us the opportunity to use foreign trade, external conditions, foreign exchange funds and the international market to promote the rapid development of the technology of the electronics industry.

With regard to international experience, countries with advanced industrial economies such as the United States, Japan, Great Britain, France and West Germany all pay great attention to their level of dependency on the international market. For example, in 1981, the volume of exports of U.S. electronics products was 2,034 times greater than China's, and it constituted 8 percent of the United States' total volume of exports. In the 1970's, Japan's level of dependency on the international market was approximately 10 percent, and this effected a 40 percent growth in its domestic market, and each 100 million yen increase in exports enabled domestic output to increase by 326 million yuan. During the 1981 oil crises, under the circumstances of a deteriorating world trade situation, the volume of Japan's electronics industry exports exceeded 5 trillion yen (approximately \$22.4 billion). It constitutes half of the output of the entire electronics industry, a 24.5 percent increase compared to the year before, and also constituted 15.3 percent of Japan's total trade for the year. This also made a new contribution for the growth of Japan's domestic economy. The product resources and technological resources of our electronics industry are not abundant, and even more so we must possess the viewpoint that "all the riches in the world are ours to use" and must strive to import technology, utilize the international market, expand exports, create more foreign exchange and develop the economy. First, we should set up a "Silicon Valley"-style base in the coastal port regions that relies primarily on exports. We must promote joint ventures and working together with other countries, permit trade and other such forms, import advanced technology and equipment, develop new products, rely on the needs and circumstances of the domestic and foreign market, determine the ratio between foreign and domestic sales and allow a number of products to be placed on the domestic market so as to attract the investments of foreign businessmen. Second, we must pay attention to new products, quickly analyze and research them, copy and bring forth new ideas, change

them into new products with special characteristics, quickly put them on the international market, continuously change the varieties and attract users. Third, we must strive to develop products with international cooperation. Cooperative production has already become a popular form in the world economy. For China to export fully assembled electronics products, it must choose superior basic components from all the countries, and it must import and assemble spare parts and components and then stick on its own trademarks. We can also cooperate with foreign firms and use their name-brand labels to promote the sales of our products. Fourth, we must utilize and give play to the ability of our factories to process and assemble, cooperate with foreign businessmen, import and export in great numbers and import loose parts or modules, process and assemble complete electronics products and then re-export them.

(3) We must strive to develop the export of consumer-oriented electronics products. Western industrial nations have concentrated their main efforts on seeking ways to work with the new technology and change the industrial structure, and they have gradually reduced their traditional industries. This gives China an excellent opportunity to develop consumer-oriented traditional products. Such traditional products as televisions, refrigerators and washing machines are becoming saturated in the advanced nations, are being replaced and updated and are appearing in different designs. Yet they are still in great demand in China and in developing nations. There is no end to the demand for these products by consumers. There are more than a dozen categories and 120 varieties of traditional consumer electronics products on the international market such as video and sound, entertainment, chronograph calculators, home telecommunications, air conditioners, cooking utensils, cleaning, lighting, cosmetics and health care, security devices, study aids, and work tools. There is also a development toward "small consumer goods" for family consumption. We must give full play to the processing and assembly capabilities of our electronics industry, and both strive to develop and produce traditional consumer electric appliances, suit the demand of the international market and also actively import the new technology to develop new products; the prospects for development are vast and the market is huge. According to forecasts, by 2000 the Third World will produce 30 percent of the world's goods and will enter the consumer and industrial markets of the United States and other developed nations.

(4) We must give full play to our intellectual superiority and strive to develop the export of software products. With the mass-production and broad applications of computers, society has an extremely great and ever-growing need for software. The Chinese people have always been known throughout the world for being adept at mathematics and technology and for their developed intellects; China's great potential for developing software is far superior to that of any country in the world. China has great superiorities for making software for export. First, it has a large population, is rich in intellectual resources and has great potential. Second, its labor wages are low, and its wages are only 10 percent of what software personnel in India earn and 2 percent of what they earn in the United States (software personnel with 5 years of experience earn

\$11,000 in India and \$50,000 in the United States). Thus, China has a strong competitive capability to engage in intellectual exports. Because China has not paid sufficient attention to the development of software, its initial steps have come very late, and many American companies look to India to produce software. In the past few years India's software exports have increased many times over, and India has become a great upstart.

(5) There are bright prospects for developing exports of electronics materials. Advancements in science and technology have created an even greater demand for materials. New materials are the basis for developing the material base of the new electronics technology. There is a broad range of categories and varieties of special materials needed by the electronics industry, and the demands are extremely rigid and special. New materials have developed quickly in the world's new technological revolution, and it has been difficult for the metallurgical industry departments to ensure a supply. In order to ensure the needs of the electronics technological revolution, the electronics industry must give full play to the roles played by the electronics materials factories and research institutes in the past 30 years and must further establish jointly run entities and set up a system for the research, development and production of electronics industry must be allowed to be self-managed. We must help supply each other's needs and exchange information on new materials. Many special materials of China's electronics industry are export products that create a large amount of foreign exchange and great profits.

(6) We must actively seek investment from abroad for jointly run enterprises. Under the new circumstances of the current worldwide information economy, the situation of jointly run enterprises as well as intelligence and investment exchange between countries has increased. China's electronics industry has more than 120,000 engineers and technicians, and they make up a good-size intellectual resource. China not only needs to import foreign capital but also must go abroad to develop joint-venture trade.

1. We must engage in monetary and technical cooperation with foreign countries and expand the production and sales networks abroad. By paying attention to the development of the markets of Third World countries, we can shake off the competition of the developed nations for our electronics products.

2. We must cooperate with the developed nations to open up a flourishing industry, and we must use advanced scientific research methods and production equipment, develop and produce new products and both put them on the international market and import for our domestic needs.

3. We must give full play to the role of Hong Kong and Macao. We must strive to use our intelligence and capital, set up a flourishing industry, develop new products, open the international market and develop the entrepot trade of importing materials and assembling them. By closely coordinating Shenzhen, Zhuhai and Guangzhou with enterprises and research institutes in the interior of the country, we are building a bridge that transports new technology, new equipment and new products.

4. We must cooperate with foreign countries, contract for the design and installation of electronics, communications, broadcasting and other systems engineering, provide complete sets of equipment and technical labor service and promote the export of complete sets of equipment.

(7) We must establish a modern economic information center for the electronics industry. Economically developed nations all pay great attention to developing the uses of information and take note of up-to-date and effective information. China generally does not pay attention to the role of information; information is not up to date, and it does not seem to matter whether or not there is information. During this period of rapidly developing electronics technology, we must perfect the construction of the information system for our electronics industry as quickly as possible. Guangzhou is adjacent to Hong Kong and Macao, and its information resources are abundant and its telecommunications developed. We must set up an economic information center for the electronics industry in Guangzhou and develop a document base and data base. We must use computers to tap into the national and international joint-machine quality inspection system, and through a satellite communications network, we can hook up with foreign information data bases and quickly check the criteria, standards and new trends in research in electronics science, applied technology and the electronics technology of products from all countries, and we can check new technology, new products, different market conditions and other information and provide the information to users in a timely fashion. The volume of information flowing worldwide is increasing at an explosive rate, and whoever first receives and utilizes information resources has the chance of being the first to achieve success.

(8) We must pay attention to the commodity inspection work of the electronics industry. China's current inspection of the classifications of import and export commodities does not suit the needs of the foreign trade of China's electronics and technical products. Thus, I make the following suggestions to the State Inspection Office: 1. "electronics industry" categories must be classified as legally inspected import and export commodities. 2. Electronics products come in many varieties and have complex technologies, and electronics-technology import and export corporations and companies must establish commodity inspection organizations and, under the guidance of the state and inspection bureaus in the ports (provincial, municipal), develop the inspection business.

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FOREIGN TRADE AND INVESTMENT

SOLUTION TO TEXTILE EXPORT QUOTA PROBLEM OUTLINED

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[Article by Zhou Xiangang [6650 2009 0474] of the China Textile Corporation:
"How To Solve the Problem of Apparel Export Quotas"]

[Text] Quota trade is trade subject to quota restrictions in the import or export of commodities. As early as the 1930's, importing countries, in order to protect their own industries, adopted the methods of either boycotting or restricting imports of textiles. In 1961, the United States and Japan signed the first textile agreement and according to a bilateral agreement determined the variety and quantity of textiles to be imported or exported. In the 1960's, the export of textiles by Hong Kong, South Korea and Taiwan developed quickly. They rapidly supplanted Japan, became the "the great suppliers" of textiles to the United States and in succession all signed textile agreements. Apparel is an extremely sensitive commodity in international trade; many countries and regions, especially a few advanced nations, for the most part have carried out protectionism toward their own apparel industries and have adopted the method of quota restrictions on imported apparel. Currently there are three methods worldwide for carrying out quota restrictions. The first is the global quota: every year the government puts quotas on the volume of imports and extends quotas to importers, firms, department stores and relevant government departments. The quotas extended only give a clear indication of the type and quantity of imported commodities and do not restrict imports from different countries or regions. That is to say, imports from different countries and regions are geared to the entire world. Importers have quotas and can freely choose the countries and regions from which to import. Australia carries out global quota restrictions. The second method is the unilateral quota restriction. One country's government unilaterally announces its import quotas on one type or a few different products from a certain country. An importer applies for an import permit by signing a formal agreement with the exporter, and the importer after obtaining the permit can then import. The number of import permits granted cannot exceed the unilateral restrictions announced by the government. Switzerland, Sweden and other countries employ this method for a number of textiles and apparel exported by China. The third type is a quota from a bilateral agreement. Through consultations between two countries, an agreement is signed putting quotas

on the import or export of certain commodities. China employs this method for the textile goods it exports to the United States, the countries of the European Economic Community [EEC] and Canada. In this essay I will discuss how to solve the problems with trade quotas from bilateral agreements.

I. Emergence of Trade Quotas on China's Apparel Exports

China's apparel exports to capitalist nations started slowly to develop in the 1970's and in the past few years have gradually caught the attention of the importing countries, mainly the United States, the EEC countries and Canada. These countries, under protectionist policies, have continued to make agreements on quotas with Hong Kong, South Korea, Taiwan and other countries and regions. They have one after another made bilateral agreements with China's government for quota restrictions. In 1979 and 1980, China, through consultations, signed accords and agreement1 with Canada, the EEC countries and the U.S. and started to implement the bilateral agreements for trade quotas. China's agreements with the United States and Canada list the types of products restricted and call them products subject to quotas, and products which are not listed has having quotas are called products not subject to quotas. It is possible that the export of the types of products not subject to quotas will not be restricted, yet under certain circumstances the importing country can list products subject to quotas in its discussions. China and the EEC call the types of products that are subject to quotas types of products subject to quotas. Products subject to quotas can also be divided into EEC quotas and regional quotas. EEC quotas are placed on products on which all EEC member nations carry out restrictions. Regional quotas are placed on products on which only one or a few nations carry out restrictions. Types of products onwhich quotas have not yet been placed are called "basket" [lan zi 4691 1311] products. "Basket" products have conditions which can also be said to be criteria. That is to say, if the volume of "basket" products exported has exceeded a certain percentage of the volume of imports set by the EEC besides that which has been set by each EEC nation, the EEC has the authority to demand that they be listed as products subject to quotas. The percentage of the total volume referred to above is called the "basket" criteria. If our volume of exports exceeds the "basket" criteria, the EEC or any one or a few EEC member nations have the authority to demand that the products be subject to quotas.

In the past 2 years, China's quotas for exporting apparel to these countries have continuously increased. For example, at the present time, there are already 30 products subject to quotas and agreed-upon products (the products for which a quota has already been agreed upon) of woven apparel to be exported by China to the United States. Importing countries under some circumstances have called for negotiations, and the Sino-American textiles agreement has such a condition: "If the U.S. government believes that the import of any one or a few types of products from the PRC that are not included under existing quotas harm the market and are damaging to the point of obstructing the normal development of trade between the two

countries, the U.S. government, in order to avoid this type of damage to the market, can demand negotiations with the PRC government...." The period of negotiation is 3 months, and if an agreement has not been reached through negotiation during the negotiating period, the importing country can implement unilateral measures, that is, one side can announce the import quotas. During the period of unilateral restrictions, both sides continue to negotiate until both sides come to a satisfactory conclusion and reach an agreement.

How are the quotas determined in bilateral negotiations? Usually they are considered using the documented results of imports from the first 12 months of the 14-month period prior to the day negotiations start. They certainly also consider the amounts from the contracts that have already been signed, especially the quantities that have already been put into production and that have been produced. The results of the negotiations are that usually the actual figures from the afore-mentioned 12-month period for imports are exceeded, and the amount by which they are exceeded depends on the results of the negotiations; it is not fixed for any given variety. China has 4- and 5-year agreements that it has signed with these countries, and after the quotas have been set in the first year, an annual rate of increase is agreed upon for each category of product. The rate of increase for each products is also different: it can be 3 percent or 4.26 percent and the highest is only 6 percent. In the EEC, if there is a quota placed on a variety by the entire EEC, after the quota on the volume has been determined, the quantity of each member nation of the EEC is proportionately allotted. As stipulated in the agreement between China and the EEC, the quotas are distributed as follows: West Germany 28.5 percent, Great Britain 23.5 percent, France 18.5 percent, Italy 15 percent, the Netherlands 10.5 percent, Denmark 3 percent and Ireland 1 percent. Furthermore, 19 percent of West Germany's quota goes to the West Berlin Exhibition, and this portion of the quota, according to a signed treaty, can only be used at the West Berlin Exhibition.

II. Problems That Are Worth Studying

Trade quotas on apparel exports are still a new problem for us. Until today there has not been a comprehensive and systematic method for managing and using quotas, and many problems still exist, especially concerning how to manage, use and deal with trade quotas competently. An especially large gap exists compared to Hong Kong. The United States, the EEC and Canada are the world's major apparel importers. For example, in 1981, they imported \$25.85 billion worth of apparel (including woven and knitted apparel). Of this, the United States imported \$8.12 billion, West Germany \$7.18 billion, Great Britain \$2.61 billion, France \$2.46 billion, the Netherlands \$2.32 billion, Belgium \$1.57 billion, Canada \$840 million and Italy \$750 million worth of apparel. These countries combined accounted for more than 60 percent of the world's apparel imports. In the past few years, China's export of apparel to these countries has developed fairly quickly. In 1983, the total value of apparel exported to these countries by China constituted approximately 57 percent of China's

total apparel exports, and of this about 85 percent involved varieties subject to quotas. Further, the export of other varieties not subject to quotas will also promote the trade of varieties subject to quotas. China has great potential for development in exporting apparel to these countries, and with regard to China's export of woven apparel to these countries, the value of China's exports constitutes only 3.8 percent of the woven apparel imported by these countries, a far cry from the amount that Hong Kong, South Korea and Taiwan export to these countries. Hong Kong, South Korea and Taiwan implemented trade quotas with the United States, the EEC and Canada earlier than did China, yet their export quotas to these countries have developed quickly. How is that so? The main reason is that they have devoted a lot of time and energy to managing, using and dealing with trade quotas competently. First of all, they use up their quotas and, second, they strive to develop from exporting low-quality apparel to exporting medium- and high-quality apparel and use the favorable conditions of quotas to sell at a good price.

III. Competent Management and Use of Quotas

To manage and use quotas competently, we first must have scientific management methods and, second, we must maintain a high degree of responsibility in our work. Hong Kong is the best in the world at managing quotas; besides using scientific computer management methods, it has also outfitted a good number of specialized talented personnel to manage quotas. The criteria for competently managing and using quotas are both to use up the quotas and not to exceed the quotas, thereby causing the importing nation to detain imports. In the past 4 or 5 years, in China's apparel exports to the United States, the EEC and Canada, the phenomena have regularly occurred whereby quotas are not being filled or are being exceeded, thus causing the importers to detain imports. Unfilled quotas create losses for the country; exceeding the quotas and having imports detained bring great losses to customers and the effect is not good. Sometimes because of detained imports, products which are well produced cannot be exported, and this creates overstocking and waste on our side. This is all caused by bad management and poor use of quotas. Below I will raise a few suggestions concerning how to manage and use quotas competently.

1. Correctly Determine the Allotment of Quotas

We must make clear through bilateral agreements the level of the quotas restricting imports and exports for any year for any product that has been deemed as subject to a quota. Yet the quantities allotted in our quotas in a given year are also the quantities that we can use in that given year. We must consider the following few factors in order to determine correctly the quantities allotted in our quotas: 1) the agreed-upon quantity for a given year; 2) if imports were detained because quotas were exceeded the previous year, the extra amount that is included in the quota of the current year; 3) if this year's quotas were used last year for another purpose, the specific amount; and 4) if last year's quotas were not completely filled, after negotiation the specific amount that can be carried over to

the current year. These four factors have all been elucidated. If we reduce what must be reduced and increase what must be increased, we can finally arrive at the exact figure that must be allotted. In the past, because of lax management, chaotic use and inaccurate reporting of figures, the amounts allotted were frequently determined inaccurately. After the totals are determined, they must be rationally distributed within China.

2. Follow the Principle of Distributing Quotas

We must rationally distribute quotas, and this requires that we then distribute them according to a definite principle. The principle for distributing quotas is: use the actual import figures that the importing country's government has proposed in the first 12 months of the past 14-month period starting on the day negotiations were proposed and appropriately consider the contracted figures at hand that have already been produced or that are being produced. Quotas for newly opened companies according to the afore-mentioned principle are allocated by the company that originally undertook the exports. In implementing the distribution of quotas for the second year and beyond, in addition to considering the base figures that were originally distributed, we must also consider the following factors: 1) in quotas that were not filled, the waste that was created without reason must be deducted from the amount distributed in the current year; 2) those quotas that were exceeded last year without the approval of a relevant department must be appropriately penalized when this year's quotas are distributed; 3) those who have successfully managed and used quotas will be appropriately rewarded; and 4) units that sell the same products at high prices and yield good economic results must be rewarded in their distribution and must choose the best plan.

3. Correctly Use the Entire Quota

It is ideal to use 100 percent of the quota and not to exceed it. In order to ensure that each company completely fills the quota it has been allotted, when the agreement is signed it must analyze and study the customers' letter of credit, the percentage of contracts honored and other factors so as to use the entire quota competently. Because the period of production for apparel is fairly long, if the agreement for the current year's quotas has not been signed by the end of May, according to regulations the initiative must be taken to hand over the quotas that have not yet been agreed upon to the main office of the corporation, and the main office will organize the redistribution of the use of the quotas between each company. We must also redistribute the use of quotas between corporations for varieties of products that are under the overlapping jurisdiction of a few corporations so as to ensure that the current year's quotas are completely filled.

4. Correctly Differentiate Between the Categories of Commodities

The categories of products subject to quotas are fairly complex, and it is easy to make mistakes if we are unfamiliar with the commodity classification methods of these countries. We can wrongly consider products subject

to quotas to be products not subject to quotas, we can regard products not subject to quotas as products subject to quotas or we can wrongly classify a product as being subject to quotas. This all creates chaos in the management and use of quotas and it directly affects the management and use of quotas. For example, the cotton dress with straps we import to the United States belongs to quota category 337, but women's dresses come under non-quota category 359. As another example, pure cotton women's blouses, jackets and parkas come under quota category 335, but bests or women's coats with Chinese collars and Chinese-style buttons down the side belong in non-quota category 359.

5. Competently Use Flexible Provisions

It is stipulated that there should be flexible conditions in all bilateral agreements, and they can be summed up in the following three provisions: 1) provisions that continue to be employed: this means that quotas not completely used the previous year, as agreed upon in bilateral discussions and according to a stipulated percentage, will be handed down to be used the following year. 2) Provisions for shifting: this means that varieties subject to quotas, as agreed upon in bilateral discussions and according to a stipulated percentage, can be shifted to either imports or exports for different classifications; we can only shift to imports once according to a stipulated percentage, yet in shifting to exports there are no restrictions in volume or frequency. 3) Provisions for alternative uses: this means that quotas that are exceeded in use or in business needs, as agreed upon in bilateral discussions and according to a stipulated percentage, can be used for another purpose the following year.

Correct use of flexible provisions is an advantageous in competently managed and using quotas. For example, China's exports of apparel in categories 641, 347/8, 340, 341 and other varieties subject to quotas to the United States were blocked because the quotas were exceeded. China then used a flexible provision for shifting, and it shifted its quota for 200,000 dozen of the unmarketable category 347 quota which could not be filled, thus both solving the problem of the export of a number of goods being detained and completely using up quotas on unmarketable varieties.

Using flexible provisions must be immediately mastered by corporations and must be used to balance quotas comprehensively.

6. Implement an Export and Import Permit System

In the past, a date stamp invoice system was employed by each company for trade quotas for exports to the United States, and because of lax management, quotas were constantly exceeded and imports were detained. Starting this year, China has completely implemented an export quota system for trade quotas for exports to the United States, and this is extremely necessary. Computers are already being used to manage the volume of export licenses issued. This way we can correctly and promptly comprehend the progress of all types of export quotas, and we have ensured the competent management and use of quotas.

7. Correctly Handle Statistics

In order to manage and use quotas competently, we must also have correct statistics for transactions, for production that awaits transportation, for contracts which have been withdrawn from and for other figures. With this correct data, corporations can then correctly analyze and make assessments, promptly adopt measures and so ensure the competent management and use of quotas.

IV. Improvement of Economic Results, Development of Export Trade

The discussion above concerning the competent management and use of quotas is one aspect of doing a good job with trade quotas for apparel exports. Yet an even more important aspect is to use the advantage of quotas to strive to improve economic results and develop trade in apparel exports. Products subject to quotas, under ordinary circumstances, especially under the circumstances of a good market, are goods for which the demand is greater than the supply and are intended for a sellers' market. This has created favorable conditions for doing a good job with trade quotas. According to the stipulations of the agreements, China has a quota with the United States, the EEC and Canada for more than 154 million articles of woven apparel. This is an extremely objective figure. Whether we can do a good job with our trade quotas is definitely interrelated with the development of our apparel exports.

The "good" in the phrase "doing a good job with trade quotas" must be embodied in improving economic results, developing export trade and increasing foreign exchange revenue. How are we to do a good job with trade quotas on apparel? I make a few suggestions below.

1. Sell Products

Quotas on apparel limit the volume but not the price. For quotas set by the United States, the quantity is set according to a plan, and even though there is a certain amount from the conversion into square yards, there is still disagreement over the amount of material used in apparel. Products subject to quotas are classified under three categories of materials for apparel, i.e., cotton, man-made fibers and nylon. For example, there are 40 categories of woven apparel, and of these, 30 categories include products that are subject to quotas and that are being negotiated. In calculations, no difference is made between adult apparel and children's apparel, no difference is made whether a lot of or a little material is used, whether the price is high or low or whether the style is simple or elaborate and no difference is made between whether the price of the finished product is high or low. Concerning the EEC and Canada, for many products no difference is made even for the type of material. This creates favorable conditions for us; we can strive to promote apparel with high prices, we can sell adult apparel but not children's apparel, we can sell long pants but not shorts, we can sell medium- and high-quality apparel but cannot sell low-quality apparel and we strive to sell at a high price.

The results from this are that the volume of apparel exported is the same, yet total exports have increased, foreign exchange revenue has increased and trade has developed.

2. Sell at a Good Price

A good price means a price that yields high economic results. Products of the same category that are subject to quotas, such as unlined jackets and lined jackets, have similar quotas. The lined jacket has a higher price than the unlined jacket, yet the higher price does not necessarily mean that the economic results will be higher. Thus, we must both sell at a high price and a good price; we can then be assured of having competently used our trade quotas. A good selling price is the key to the effective handling of trade quotas.

With regard to what forms of trade we should use for sales, we usually adopt the method of "fixing the price in increments." Based on the special characteristics of trade quotas and business demands, we can also employ such methods as processing imported materials, using sales agents and accepting and entering bids. In our actual trade, the trade method of processing imported materials is widely used and compensates for China's current weaknesses of drab apparel and material, too long a period of business transaction and not suiting the changing needs of the international market. The method of acting as an agent is used under many different circumstances. In trade quotas for the export of China's apparel, the method of acting as an independent agent is employed only for exports of apparel to Denmark. Considering that this country has a fairly small market and few quotas, it is fitting to appoint one agent to market China's trade quotas, and the results from the past few years have been good. Usually it is not appropriate to employ the method of using agents. Accepting and entering bids under certain conditions is a good method for promoting quotas. For example, at the China Export Commodities Trade Fair in the spring of 1984, the Apparel Goods Section of the Textile Trade Delegation openly used the form of accepting bids for sales. They accepted sales bids for a quota of 1.45 million dozen articles of apparel that they selected from the products subject to quotas exported to the United States, West Germany and Canada. The method worked like this: on the day that the trade fair opened, we openly announced to traders and companies the countries, products and quantities of the sales bids as well as the period the bids would remain open. Traders (buyers) took the initiative to offer bids and signed bid contracts with branch companies; a provision was added to the contract for "obtaining effective quotas from the main offices of the companies." Traders vied with one another to enter bids, and in a mere 15-day period, bids were received from traders to sign contracts with branch companies for 2.11 million dozen items. After a selection process, bids were accepted from 40 customers for 1.07 million items. Through sales bids, products subject to quotas sold at the highest prices ever and at the greatest profits; the average price was 17 percent higher than the price from regular trade quotas and the economic results were outstanding. This makes clear that sales bids must be carried out under certain conditions. The sales conditions of

these commodities are: a sellers' market, a healthy market and open sales targets that can be freely chosen. Further, China's export commodities subject to quotas, especially hot-selling commodities that are restricted in quantity, possess just these conditions.

It is clear from this that while we are studying how to handle trade quotas for apparel exports competently, the form of sales that we adopt is also an important aspect.

3. Promote the Export of Products Not Subject to Quotas

Goods subject to quotas are usually goods that are hot-selling and that customers request to purchase. There are still quite a few apparel products that China exports to the United States and Canada that are not subject to quotas, and the EEC still has quite a few "basket" products. Importing countries do not restrict or do not rigidly restrict products not subject to quotas and "basket" products. We can export these products in large amounts and gradually develop the volume of our exports. Yet compared to products subject to quotas, they do not sell as well, and a good number of these products sit on the market. Thus, in actual trade, we often use products subject to quotas to spur on the export of products not subject to quotas or "basket" products, and experience has shown that this is also feasible.

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CSO: 4006/95

FOREIGN TRADE AND INVESTMENT

CHINA'S FOREIGN AID WORK COMMENDED

Beijing GUOJI MAOYI /INTERTRADE/ in Chinese No 6, 27 Jun 84 pp 13-14

(Article by Xu Lijin /6079 0500 6651/: "Strive To Develop Our Foreign Economic and Technological Cooperation".)

(Excerpts) Several years ago Comrade Deng Xiaoping pointed out that foreign economic work is a strategic problem related to the construction of our four modernizations. This directive is truly of great practical and profound historical significance. The basic purpose and responsibility of our foreign economic cooperation is to strengthen economic and technological interchange with every country in the world, to increase consolidation and cooperation with the peoples of all countries and to speed up the construction of our socialist modernization on the basis of self-reliance, equality and mutual benefit.

In the past year, based on long-term experience in foreign aid and our present economic circumstances, there have been readjustments and improvements in the distribution, structure and method of our foreign aid, and the "provisional methods for foreign economic aid projects under the contract responsibility system" and other such regulations have been promulgated.

In the past 30 years our construction aid to over 80 Third World countries and regions has totaled over 1,000 complete projects, in all sending out over 200,000 engineering and technical personnel and taking in over 50,000 trainees to China.

In contract engineering and labor service cooperation, from 1979 to the end of 1983 we accumulated a total of 1,279 agreements signed with 63 countries and regions for a total value of \$2.24 billion and have concluded business worth \$940 million. At the end of 1983 there were over 33,000 people performing services in foreign countries. At present, although the scope is still not great, a good start has already been made and its future and foreign influence are good. As in the case of manual labor service cooperation projects undertaken by the Complete Sets of Equipment Export Company in Iraq, we have enjoyed the praise of enterprise owners and cooperative partners. The 150 personnel we sent to the Diyala industrial headquarters in the past 2 years have doubled daily output, quality has been clearly raised and the variety of goods has increased from 2 to 400; production was also speedily increased, and products that were formerly slow in selling are now in great demand. Our personnel at

the Fallujah floor tile factory overcame many difficulties in transforming the face of production and winning the trust of Iraq. The factory made a public announcement to the workers from China, Egypt, India and Iraq working there that all were to be directed in production by Chinese engineers and foremen, and our country thus was accorded distinction.

Hereafter, we must continue to adhere to the "four principles" and the "eight principles" as well as other relevant rules and directives of the central government, to strengthen our studies, to liberate our thought, to sum up our experiences, to improve our understanding, to unify our actions and to take a genuine view of foreign economic work as a strategic task, in order to open a new situation in our foreign economic and technological cooperation and work diligently to promote the four modernizations of our country.

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FOREIGN TRADE AND INVESTMENT

PROSPECTS FOR EXPANSION OF SINO-EEC TRADE

Beijing GUOJI MAOYI /INTERTRADE/ in Chinese No 6, 27 Jun 84 pp 18-19

(Article by Zhu Ruiqi /4281 3843 3825/: "Bright Prospects for Enlarging China's Exports to the EEC")

(Text) Since the establishment of formal relations between China and the European Economic Community in 1975, bilateral trade relations have continuously developed. At present, the EEC is an important partner in our import and export trade. In 1983 the amount of trade with the EEC surpassed our trade with the U.S., in third place behind only Japan and Hong Kong.

1. EEC Is Main Market for China's Export Commodities

Prior to 1977, China's annual exports to the EEC remained at roughly \$850 million. In 1978 and 1979, China and the EEC signed a trade agreement and a bilateral textile trade agreement. Since 1 January 1980, the EEC has accorded China general benefits system treatment. Under conditions of ever-strengthening bilateral cooperation, China's exports to the EEC have risen every year and in the 1978-1981 period the annual increase was roughly 27 percent. In 1981 it reached \$2.5 billion. Due to the economic crisis in the West in 1982 and 1983, the markets of the community's member countries were depressed. China's exports declined and exports were held to \$2.1 billion.

The EEC is the chief retail market for China's traditional export goods. China's main products exported to the EEC are cotton, raw silk, silks and satins, tea, pig bristles, sausage casings, carpets, incense, leather, rabbit fur, refined antimony, tungsten ore and chemical and pharmaceutical raw materials. These commodities are all raw materials needed for production by EEC countries or are materials needed for the peoples' daily use.

2. Bright Prospects for China's Exports to EEC

Although at present the EEC has become a main trade partner of China, China's exports to the EEC make up 11 percent of the total world export figure, while comprising only 0.3 or 0.4 percent of the EEC's total imports. Among the Community's importing trade partners, China is number 28.

According to our long-range state economic development plan, in the wake of production increases, by the end of the 20th century, our foreign trade will realize the goal of quadrupling present output. Viewing China's export capabilities and the Community's import needs, there are bright prospects for expanding China's exports to the EEC, whether in terms of the traditional export goods or new commodities just being developed.

Raw Materials and Fuels: The EEC's raw materials, raw silk, leather, incense and chemical raw materials are all needed by the Community's processing industries. The Community has a great demand for textiles (cotton, linen, wool, etc.) and various kinds of nonferrous metals and ores (copper, lead, zinc, tin, manganese, antimony, aluminum, etc.). China has ample resources and several of the above ore products are being energetically developed right now and there is a possibility of enlarging exports to the EEC. The EEC mainly relies on imports for petroleum, natural gas, coal and other fuels. Considering coal, yearly imports are about 65 million tons. Presently, China's coal exports to the EEC are still in a trial stage of only several hundred thousand tons a year. In the long run exports will increase greatly if the transportation problem is solved.

Textiles: The EEC's annual imports of textiles and clothing articles are over \$30 billion. Despite the fact that in recent years China's textile exports to the EEC have increased, 1983 only saw roughly \$300 million, still less than 1 percent. Because China's export base to the EEC has been very small, we are far behind Hong Kong, South Korea, Taiwan and other suppliers. At the same time, a very large proportion of the export products are primary products or semi-processed products such as yarn, thread, gray cloth, etc. Unrestricted products are very few or basically nonexistent. Thus, there is also potential for expanding textile exports.

Chemicals and Pharmaceutical Products: These kinds of products comprise a solid share for EEC imports, with annual import figures of about \$60 billion. Presently, China's exports to the EEC are gasoline, pharmaceuticals and dyes. A few other chemicals and pharmaceutical materials have opened up marketing channels and have good prospects for development.

Food and Special Agricultural and Sideline Products: Each EEC member country overproduces some of its agricultural products, but there are also some agricultural products that must be imported in large quantities. China may still be able to export to several members of the EEC a stable quantity of frozen pork, frozen rabbit meat, honey, dried cassava and canned mushrooms. However, exports will be affected due to (?) locked prices [zhamen zha 7037 7024 0305], quotas, and other restrictions. After the removal of these artificially imposed obstacles, exports will be able to recover and develop. Aside from this, there are numerous unrestricted special agricultural sideline products for which export potential would be great if only we actively developed production.

Light Industry Products and Handicrafts: China's proportion of light industry products among the total exports to the EEC is still very small and the styles and packaging cannot match the changes in market demand. If only we work hard

on this, exports could increase rapidly. China's handicrafts possess unique qualities and a large variety and are admired by the people of all Western European countries. In accordance with the rise in the standard of living, the Western European market's demand for handicrafts can also continuously rise, and there are undeniably superlative conditions for China's expansion of handicraft exports to the EEC.

Machinery and Electronic Instruments: In the machinery and electronic instrument trade, the EEC both exports and imports a lot. Common machine tools, hand tools, metal-working machinery, etc. are all imports needed in large quantities. Developing electrical machinery for exports is a major direction for expanding our exports. China can increase cooperation with the EEC in this regard, producing and exporting machinery needed by the EEC.

3. Expanding China's Exports to EEC Requires Common Effort on Both Sides and Overcoming Various Artificially Imposed Obstacles

With regard to China, the main thing is to maintain and develop traditional export goods while continuing to expand the variety of new export products, energetically raising product quality, improving packaging and decoration and making products satisfy marketing demands and be even better suited to them. As for trade methods, we must energetically reform management and raise work efficiency and service quality. In order to overcome a certain amount of confusion in foreign trade work concerning the opening of many doors, bullishness overseas and competition among ourselves, we must strengthen centralization while at the same time continuing to maintain and bring into full play the zeal of localities, departments and production enterprises. We believe that the expansion of exports to the EEC will be guaranteed as increasingly dependable so long as production is developing and foreign trade administration continues to improve.

With regard to the EEC, in order to develop EEC members' trade relations with China and increase imports from China, they should appropriately relax or discard all measures limiting our imports according to the principles of equality and mutual benefit. At present the EEC has many measures limiting China's exports, such as textile and certain non-textile quota restrictions and self-imposed restrictions. There are set pricing regulations for meat products and countervailing import levies are imposed. For certain products there are internal supervisory systems operating to limit free circulation within the EEC. Taking "anti-dumping" as an example, manufacturers in the EEC countries have accused China of "dumping" over 10 kinds of commodities; a few of these have had countervailing duties applied to them and have had no choice but to stop exporting. The reasons why the importing countries' manufacturers make anti-dumping appeals are many and varied. We hope that in doing anti-dumping investigations the EEC will maintain a prudent attitude and will not adopt protectionist methods. In the recent period the EEC and related members circulated a notice to us that China's export prices for wooden screws, bicycle chains and bristle brushes were too low and the quantities increased too rapidly. Affected Chinese companies took this very seriously and carried out a diligent study, adopting the necessary measures, and made appropriate restrictions and adjustments in export prices and

quantities. We believe that such cooperation is desirable. Problems can be solved and we can avoid the eruption of unpleasant anti-dumping accusations.

In sum, China and the EEC have good political, economic and trade relations. Looking toward the future, we believe that with common energetic efforts, China's exports to the EEC have bright prospects for development.

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FOREIGN TRADE AND INVESTMENT

BRIEFS

OUTDATED FRENCH REFRIGERATOR PLANT PURCHASED--Strassburg, 22 November (AP). The People's Republic of China has bought the Bauknecht refrigerator factory in Valmont Saint Avold in eastern France, which was closed in 1982, for 30 million francs (around 10 million German marks). Dismantling the plant, transporting it to China on the Trans-Siberian railroad and reconstructing it in Taijing near Peking will cost another 10 million German marks. In Valmont Saint Avold, 640 workers were occupied with manufacturing refrigerators and freezers. Currently, 60 technicians from the Chinese Technological Import Company are working there on dismantling the plant. [Text] [Frankfurt/Main FRANKFURTER ALLGEMEINE in German 23 Nov 84 p 19] 12507

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SPECIAL ECONOMIC ZONES

DEVELOPMENT IN SHENZHEN AFTER REFORMS

Beijing LIAOWANG /OUTLOOK/ in Chinese No 30, 23 Jul 84 pp 16-17

{Article by Li Zhaojun /2621 5128 5358/ and He Yunhua /0149 0061 5478/: "New Mentality, New Methods, New Approach--Fast Development in Shenzhen Special Economic Zone in Wake of Reforms")

[Text] From its emergence as part of our country's policy of opening to the outside world only 4 short years ago, the Shenzhen Special Economic Zone has achieved results, attracting attention domestically and abroad.

It has been 4 years of leveling mountains to fill in the seas, as the developers shout, "Time is money, efficiency is life!"

It has been 4 years of builders smashing through the confines of a closed and locked country, opening the windows to inhale fresh air!

It has been 4 years of China's sons and daughters vigorously developing the country, with patriotic fervor, intelligence and wisdom!

One can understand what "the Shenzhen pace" is by looking at the following figures:

In the 4 years from 1980 to 1983, the gross industrial output value amounted to 1.41 billion yuan, at an average annual increase of 85.7 percent.

Investments in completed capital construction in this period were 1.914 billion yuan, at an average annual increase of 21.5 percent.

The financial income of 4 years is equal to 2.2 times that of the previous 30 years.

Four years of construction are beginning to turn the desolate small towns into modernized cities. Fifty-five wide urban boulevards totalling 80 km in length have replaced the former crude, rough and narrow county town roads; 19 buildings over 18 stories high have been built and 1 of 44 stories will be completed within the year. The major portion of the 50-story International Trade Center, currently the country's tallest, was completed in only 207 days. It towers over the other buildings. All of the city's basic installations have been

basically completed. In these years the desolate beaches of Shenzhen Bay on the Shekou Peninsula, 30 km from the municipal area, have become a new style of a comprehensively developed seaport industrial zone where priority is given to industry. A group of scenic tourist spots with modern facilities and Chinese characteristics are attracting more and more tourists. The people's standard of living has been notably upgraded. Average monthly wages in state-run enterprises have reached 131 yuan, while incomes for workers in joint venture and foreign-owned enterprises are even higher. The average annual income for peasants is up to 840 yuan.

Why has the Shenzhen SEZ prospered so rapidly? Of course, the factors include adherence to the open-policy trend of the times, reliance upon the entrepreneurs' industriousness plus the favorable location adjacent to Hong Kong. However, the most important factor is the pioneers' resolve to reform and break through those bad customs and backward management methods which, 30 years of our socialist construction have proved, fetter the development of productive forces. As soon as they began, they explored a new path in rapidly developing the social productive forces suited to national conditions. They are carrying out reform efforts on 327.5 square km of land.

At that time, people were heavy-hearted about introducing foreign funds because it was considered a revolt against "self-reliance." However, the special zone's development proves such worries to be untenable. In the past 4 years, Shenzhen has concluded 2,697 agreements with foreign businessmen, invested U.S.\$1.8 billion and introduced more than 30,000 units (sets) of equipment, for example, equipment for quadricolor folio printing and two-color perfecting, photo-mechanical processing techniques, microcomputers, computer software manufacturing, new electroplating techniques, construction machinery and equipment, new fitting up techniques, etc. Last year, industrial projects that were introduced accounted for 81 percent of all projects introduced. The introduction of these techniques has brought fresh blood into the economic body of socialism, once again proving the great power of the party's open policy.

In the early period of construction, the Shenzhen special zone discovered that reforming the cadre system was a prerequisite for overall reform and for bringing people's initiative into full play. In the early stage of the Shekou Industrial Zone, cadres were transferred by the organizing departments from various units as usual. Some people's scientific and educational levels were very low and they were unsuited to work related to the opening to the outside. On one occasion, a British observation group from Cambridge University came to visit and a leading cadre asked, "How large of a bridge can your school build?" Another cadre asked an American businessman, "In England they speak English. What language do you speak in the U.S.?" Such exhibitions make faces red and impel the spirit of reform. So they immediately destroyed the traditional cadre assignment method and recruited talent via exams. Since then, those who understand business have prevailed. Of the 793 cadres presently in Shekou, nearly 500 are engineers or were educated in colleges or technical schools.

In order to prevent those occupying positions of leadership from abusing their power, the routine of "transfers being regular and the talented having a hard time avoiding them" is being changed; the special zones have strengthened the

masses' supervision of cadres. Among cadres and engineers first, the zone is trying out a secret ballot to elect an administrative committee democratically and is implementing a trust ballot to supervise the committee's work. A group of young people with insight has been chosen as leaders of the zone's administrative committee. In April of this year, when the leading group had been in office for 1 year, over 300 vice managers, assistant engineers or above in the industrial zone voted secretly and on trust. The outcome of the ballot showed that 84.3 and 87.9 percent are satisfied and relatively satisfied, respectively, with the party committee. Eighty-two of the ballots showed sharp and sincere criticism of the leading group. This is how the core of the leadership has been put before the masses' regular supervision.

Old concepts in the personnel placement system are being broken one by one while a new upsurge in economic reform is in the making.

On the capital construction battlefield, the special zones have broken the former deadlocks in planning, investment and construction and have implemented overall responsibility and contract bidding. First, the whole city formulated an overall blueprint for development. According to this integrated plan, it implemented the "five integrated measures" of site drafting, designing, construction and site management and funding to focus planning forces in one area, development in another and construction elsewhere. In business methods for construction projects, the old manner of administratively assigned tasks has been destroyed and a new method used in which designs are chosen by public appraisal, projects are bid for and construction is by contract. Presently, to construct a six-story housing unit takes 110 days, shrunk down from 180 days in the past. On the average, each upper story can be completed in about 5 days, which is approaching the rate in Hong Kong. In the past 4 years, several hundred construction projects have been done at a high speed, high efficiency and a high quality every year. Over 3.28 million square meters of construction have now been completed and turned over to the users.

They are using various channels to raise funds. Where have the funds needed for the special zones' large-scale construction come from? They do not put their hands out to the state but think of ways to raise money on their own. First, foreign capital is used as much as possible. In the past 4 years, nearly one-third of the capital construction funds have come from foreign investments. At the same time, the roles of finance and credit have been brought into full play and bank loans have been used for key capital construction projects. Bank loans over the 4 years amount to more than 400 million yuan, part of which was used to open parcels of land then sold as post-processing lands. Another portion was used to construct up-to-standard plants and commodity facilities, and then advance payments were used to withdraw funds and reinvest in the development and construction of new projects. Such a "snowball rolling" method greatly accelerated the turnover of funds. Additionally, they also issued stocks and bonds and other ways of collecting society's idle funds for use in capital construction.

They have broken through the stifling restrictions in the area of commodity circulation, correctly understood and applied the law of value, encouraged circulation channels and opened new markets. In accordance with the relevant

special zone policies, they have set up their own pricing systems that not only allow moderate price fluctuations but also permit various enterprises to compete in the market.

Presently, markets in the special zone have changed from being unitary and closed off to being pluralistic and outward looking, forming a network of new interlocked business structure. The scale of business is quickly expanding and financial revenue increases greatly year by year.

They have changed the egalitarian distribution method of eating "from the same big pot." In worker recruitment, once enterprise units changed the outdated practice of centralized selection, assignment and responsibility, labor departments implemented the "labor contract system," "public recruitment" was used for technical and specialized cadres and the enterprises' leading groups tried out a "selection recruitment contract system." Based on their own characteristics and the needs of the productive enterprise, enterprises can determine the wage format and use a floating, piece-rate or wage responsibility system.

They have made new attempts at simplifying administrative structures, expanding the autonomy of enterprises and reforming the management system. In accordance with the principle of "simplification and high efficiency," people are fitted to jobs and administrative levels are reduced as much as possible. The party committee and administrative committee of the Shekou Industrial Zone are located together with some administrative offices of foreign oil companies in the same building. Matters such as negotiating projects with foreigners, concluding agreements and arranging for the installation of water and electrical equipment, recruiting labor and renting or purchasing dwellings can be completely handled in a few days, provided that all are in the same building.

Looking back on the Shenzhen SEZ's difficult past, the people are gratified: a proud offspring of the times has ultimately proved their talent and leapt onto the road of reform. The completely new businesses that have been opened up give us entirely new concepts and entirely new information. The people clear-headedly realize that what has appeared here is different from the free processing zones in capitalist societies; it is also different from the economic patterns of our inland special zones. By stressing the entirely new attitude of speed, efficiency and results, Shenzhen will take the national lead in striding into the ranks of the modernized.

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SPECIAL ECONOMIC ZONES

PROBLEMS FACING LABOR UNIONS IN SEZ DISCUSSED

Beijing GONGREN RIBAO in Chinese 10 Oct 84 p 3

[Article by Qi Ping [7871 1627]: "Some Tentative Ideas on the Question of Labor Unions in Special Economic Zones"]

[Text] Not long ago we made some investigations in Shenzhen on the problems of labor union activities in special economic zones. In Chinese and foreign joint ventures and cooperative enterprises and foreign wholly-owned enterprises we contacted Chinese directors, labor union cadres and workers, as well as agents of capitalists, and talked with them to learn the situation. Now we put forward some tentative views on the problems of labor unions in those zones.

I. New Problems That the Labor Unions in Special Economic Zones Are Facing

The basic economic characteristics of special economic zones permit the existence and development of state capitalism, allow the establishment of state capitalist enterprises, and assure the owners of those enterprises that they have a right to make profits in accordance with the laws of our country. The government uses foreign capital (including capital from Hong Kong and overseas Chinese) to establish an enterprise with capital investment of a single owner or as a joint capital investment. The purpose of this policy is to use foreign capital to bring advanced technology for development of production and help in the achieving the four modernizations planned for our country. Workers and union organizations in the special economic zones must make those aims their special mission in this new historical period, must conscientiously follow the policy of opening up to the outside, must work hard for development of state capitalism and its enterprises, and make their contribution to the construction and modernization of our country. This must be the basic task of the labor unions in the special economic zones.

In carrying out these basic tasks the labor unions are bound to confront several special problems. The first is how to deal with the capitalists.

We must welcome foreign investors to the special economic zones in order to establish factories. On the one hand, they come to make money, and making money includes exploitation; on the other hand, they come to invest capital and build factories, which is to China's benefit. The fact that they come to establish enterprises and bring in capital and technology, no matter what their intent, benefits our four modernizations plan. Among investors are a

great number of overseas Chinese who love China and their native towns. The union organizations should let the workers realize the dual nature of overseas Chinese and support these investors from the beginning to end, from the construction of factories to putting them into production, and to running them successfully. We must protect the lawful rights of investors, allow them to have their functions and power in management, and allow them to secure their rightful economic profit. Only in this way can we attract more and more overseas investors to our country and reap more benefits. Certainly, when dealing with foreign investors, we have to adhere to the four principles and safeguard the honor of our national laws. In obtaining benefits we are not supposed to forget socialism, barter away our principles, or lose our national and individual dignity.

Another important question is how to approach the employees and workers from Hong Kong, Macao, and foreign countries. There are very few among them who can be called agents of capitalists. The majority of them are technicians and administrators; they too, are employees. We must treat them correctly, take proper measures to oppose and stop any badgering of the workers, and learn from their knowledge, technology and experience. We must warmly welcome them to work for our socialist construction and respect their power; we must be friendly with them and try to give them some influence.

II. The Glorious Task of the Workers in the Special Zones

The practice of construction of special economic zones places several high demands on the workers.

1. They have to heighten their political consciousness and keep their sense of being a member of the working class, i.e., the masters of society. The criteria for judging their socialist consciousness in the special economic zone are whether they correctly and consciously understand and carry out the policy of opening up to the outside; whether they correctly understand and approach the plan for state capitalism; whether they correctly understand and treat fairly the foreign investors and their employees and workers from Hong Kong and Macao; and whether they clearly uphold the four basic principles and consciously resist spiritual pollution.
2. They have to improve their understanding in the fields of general knowledge, technology and sciences, and must learn to "absorb, digest and master" the foreign advanced technology, facilities, and the management system. It is up to our workers as to whether they will be able to do this. If our working class can fulfill this special mission successfully, they will make a big contribution to the four modernizations.
3. We have to work out and put into effect strict rules and regulations, strict working discipline, and run the enterprises successfully. Toward the workers, we have to emphasize and enforce discipline. No one should think that because the enterprises are the investment of others or "half-Chinese" that we can be lax, ignore discipline, or shirk responsibility.
4. We must be able to handle the relationships between workers, investors and government, we must protect the interest of workers and government, as

well as the lawful interest of foreign investors, which means the protection of the long-term interest of the working class. As members of the working class we must safeguard the interests not only of ourselves but also of the government and foreign investors.

5. We must launch a campaign to emulate and catch up with advances and help those who lag behind. Through this campaign we can form new habits. We must praise the individuals who advance the construction of spiritual and material civilization, and the individuals who implement the policy of opening up to the outside. We must carry forward our honorable traditions and create new experiences. The mental attitude of the advanced person should become the attitude in all special economic zones. The working qualifications and technical knowledge of advanced individuals must become the social standard in all the special economic zones.

III. Some Tasks of Labor Unions in the Special Economic Zones

In order to achieve the above stated requirements, the labor union organizations in the special zones must fulfill the following:

1. The most important work of the labor unions is to elevate the workers degree of organization and consciousness. Through this work the government policy can be turned into action for the masses. At the present time the degree of organization among the workers in the special zones is still not very high. There are many enterprises without labor union organizations; these should be established. We must do this job successfully and make strong connections between the labor unions and the workers.

In order to elevate the consciousness of the workers, labor union must carry out the following points. First of all, explanation of the positions, functions, tasks and the responsibilities of the working class will enable the workers to realize their role in the construction of the special economic zones. Second, we must make the workers aware of their responsibility to the labor unions, clear up any misunderstanding, and do everything possible to resolve any problems that may result such that the workers will understand that the labor union is their own organization. Third, we must use every opportunity to educate the workers concerning the policy of opening up to the outside and dispel any confusion about this policy. Fourth, we must encourage and create every possible condition for the workers to obtain general and technical knowledge.

2. Correctly handle the relationships between the workers and the capitalists, and create sound cooperation and unity in the enterprises: Successful implementation of the policy of opening up to the outside and the growing influence that will be established in the special economic zones will build more and more enterprises in the special economic zones. Consequently, the most important work is to correctly handle the relationships between the workers and the capitalists, including good relationships and unity with the employees and workers from Hong Kong and Macao, and mobilization of every possible factor. The labor unions must safeguard the lawful rights of workers, teach them to respect the lawful rights of foreign investors, and

unite the capitalists in order to run the enterprises successfully. We must collect more experience in this aspect.

3. Stress union work in selected enterprises: Since there are many new problems in union work in the special economic zones, we must go to the basic levels and use the experience from individual places to guide union work. At the same time we must strengthen and improve the work in the city unions according to the needs of various enterprises. Generally, we must enhance the construction of labor union organizations themselves; otherwise, we will not be able to deal with the future changes and development of the economy in the special economic zones and will not be able to elevate standards of labor union work in those areas.

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SPECIAL ECONOMIC ZONES

BUILDINGS SOLD AS COMMODITIES IN SHENZHEN

Guangzhou NANFANG RIBAO in Chinese 18 Oct 84 p 1

[Article: "Shenzhen Energetically Turns Newly Constructed Buildings into Sales Commodities; Construction Industry Becomes One of the Important Economic Pillars in the Zone"]

[Text] Shenzhen Special Economic Zone has carried out a bold reform in construction. It has turned newly constructed buildings into commodities so that the construction business has become one of the important economic pillars in the zone.

Shenzhen started to sell apartment buildings and houses as commodities from 1980 on, and since then has also included factory buildings, office buildings, shopping centers, and warehouses. There are six city construction companies funded with state capital and two construction companies funded with joint-stock capital. These companies did not ask any additional state financial support, but took loans from banks and raised money from other sources and then carried out the construction in accordance with the overall plan of the city.

The new buildings in Shenzhen are sold or rented out in the following ways:

1. Contracts were signed either before the construction started, or when the construction was in progress, or after the construction was finished. Once the contracts were signed, the buyers had to make a deposit or a down-payment and the remaining money was paid when the buildings were transferred to the buyers. Nineteen out of 21 apartment buildings included in the second phase of the Binhe residential district project, which started in August of this year, were sold before the project started. Downpayments in the amount of 18 million yuan, plus 8 million yuan in profit from the first phase of the project were enough to provide investment for the second phase of the project.

2. In selling houses and apartments, buyers can make one payment in full or can pay in installments for 3 to 5 years.

3. Office buildings, shopping center buildings, warehouses and other large buildings are rented out. The rent for a shopping center is HK\$2,000 per

square meter per month; the rent for storage of dry cargo is 26 cents per square meter per day; for freezing storage HK\$1.20 per ton per day. Sometimes rents are set in a bidding competition. In these cases the sale prices or rents are determined according to the specific market situation.

In all cases construction plans are made on the basis of marketing needs in order to avoid either overstocking or a shortage of buildings.

The practice of selling buildings in Shenzhen shows that the construction business can be an important real estate business that can earn income for the state. City buildings and developing companies last year used 11 million yuan in loans from banks to build 291,000 thousand square meters of buildings. The cost for each square meter was less than 40 yuan. They used this modest amount of money to purchase and develop land for residential houses, to install water supply lines and sewers, to supply electricity and gas, to provide transportation and telephone facilities, leveling land and providing necessary facilities for the completion of construction. In order to collect money as soon as possible the buildings are sold even when they are in the design phase. This has helped the construction go further with an adequate financial cover. The builders are allowed to have 5 to 6 percent profit, so that by a snowball effect their projects can become larger and larger. By the end of August 1984 the city building developing companies sold 240 thousand square meters of houses and apartment buildings for 140 million yuan, realizing a profit of 80 million yuan. The city real estate department has turned over to the municipal finance office HK\$149 million and a tax of HK\$16.83 million and kept a reserve of HK\$5.9 million.

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TRANSPORTATION

STANDARDIZATION OF TRANSPORTATION REPORTED UNDER DEVELOPMENT

Beijing ZHONGGUO BIAOZHUNHUA [CHINA STANDARDIZATION] in Chinese No 10, Oct 84 pp 18-22

[Article by Standards and Measures Research Institute, Ministry of Communications: "Standardization of Transportation Is in the Process of Development"]

[Text] While the people of the whole nation are enthusiastically celebrating the 35th anniversary of the establishment of the People's Republic of China and hailing the significant achievements that have been made in our socialist construction projects, it is well to look back on our work of standardizing communications and to sum up our achievements and experiences so that we may bring about the modernization of communications and transportation and speed up the four modernizations projects of construction.

Since the establishment of the republic 35 years ago, our communications and transportation enterprises have progressed at a rapid pace and made significant gains. The standardization of communications is a project that is being developed from scratch. It has contributed to the development of communications and transportation by implementing the standardization policy, formulating and implementing standards, setting standards for communications, organizing projects of construction and engaging in a variety of standardization activities.

I. A Review of the Work of Communications Standardization

1. Communications standardization in the early period of socialist construction (1949-1965). At the time of the establishment of the republic, our communications standardization had an extremely weak foundation with few standards. To meet the urgent need to restore and to develop communications and transportation production at the time, we adopted from the Soviet Union the norms, standards, standardization blueprints and rules and systems of highway and water transportation. During the period of the Second 5-year Plan and the 3-year period of readjustment of the national economy, the Ministry of Communications, with a view to meeting the urgent need for the rapid development of highway and water transportation and for the construction of engineering projects, further strengthened its leadership in the work of communications standardization and, on the basis of the actual circumstances

in our country, formulated and issued regulations concerning highway construction; the maintenance and repair of motor vehicles; the technical management of transportation enterprises; highway and water passenger and freight transportation; rules, systems and standards governing the technical operations of loading and unloading in the harbors; and the control of shipping transportation, land and water transportation, inland river navigation marks and navigational engineering construction projects.

In 1956, the Ministry of Communications jointly set up with the Shipping Bureau of the First Ministry of Machine Building and the concerned departments a shipping design study group which has done useful work in the standardization of shipping and the development of the shipping industry by producing 107 designs for coastal, inland and engineering ships, 42 types of a series of 8 ship designs and designs for 5 types of boilers used on ships.

By 1960, the number of motor vehicles for civilian use had reached 2.23 million. Towing transportation had also been greatly developed. In order to cope with the serious shortage of automobile spare parts, the Ministry of Communications and the First Ministry of Machine Building jointly directed their efforts toward the standardization of automobile spare parts, engaged in 56 types of work to increase the supply of spare parts and exhorted the automobile spare parts factories in the various provinces, cities and autonomous regions to increase their production.

Between 1961 and 1965, the Ministry of Communications, while seeking to implement the "Provisional Measures for the Management of the Standardization of Industrial and Agricultural Products and Engineering Construction Projects," did excellent work in setting up standards and in standardizing construction projects.

The "Provisional Measures for the Control of Technical Standards of the Ministry of Communications," which were formulated and promulgated in 1962 with the special features of communications and transportation in mind, clearly stipulate that the technical standards of the Ministry of Communications are to be set for the three large categories covering products of the communications industry, communications engineering construction projects and the use, maintenance and repair of communications machines and equipment. Furthermore, provision has also been made to unify and give code names and serial numbers to standards set by the Ministry of Communications and the communications enterprises. "The Program (Draft Resolution) for the Development of Standardization in the Ministry of Communications, 1963-72," which was drawn up in 1963, has as its major objective the following: "Between 1963 and 1967, a series of models are to be designed for cargo shipping and trailers. Reasonable standards have, by and large, been set for the maintenance and repair of motor vehicles and ships. A large number of products of the communications industry have basically been standardized and put to common use. Between 1968 and 1972, the standards are to be gradually revised and upgraded and standards are to be set for new products." Since the work program had been clearly set, standards were formulated expeditiously. For instance, the "Provisional Standards for the

Natural Channeling of Rivers and the Navigation of Man-made Canals" approved and issued by the State Planning Commission, "The System for the Technical Control of Motor Vehicle Transportation Enterprises and Technical Standards Applying to Motor Vehicles" approved and issued by the Ministry of Communications and the 84 technical standards set for shipping repair are all standardization documents of considerable importance. In addition, the series of technical standards set for highway and water transportation construction has served to promote communications construction at the time. In 1964, to meet the need to develop shipping and the shipping repair enterprises, the Ministry of Communications strengthened its leadership in the work of standardizing shipping, issued notifications concerning the establishment of organizations for coordinating the work of standardizing shipping and gave its stamp of approval to the coordination committee for the standardization of the shipping system in the Shanghai area. The Ministry of Communications also set up five work units for the standardization of shipping in the communications system, stated clearly their respective responsibilities and laid a foundation for pursuing further the work of shipping standardization in a professional manner.

Between 1966 and 1970, while the "Great Cultural Revolution" was in progress, the work of standardization came to a virtual standstill.

2. The work of standardization in communications was gradually resumed and developed between 1971 and 1975. The work picked up especially in 1972 when Premier Zhou issued the noble call to "give our harbors a new look in 3 years" and in 1973 following the National Conference on the Work of Shipping Standardization. The work of standardizing shipping with the emphasis on simplification and unification to deal with the longstanding and sizable problem posed by a multiplicity of shipping and engine designs and the shortage of shipping was well rewarded. For instance, the number of designs for inland river shipping was reduced from 975 to 207. A "Simple Catalog of Accessory Shipping Products of the Ministry of Communications" was also compiled.

3. Between 1976 and 1978, the Ministry of Communications, in order to meet the need for the development of the national economy, to improve the technical standard of transportation equipment and to engage on a priority basis in the work of setting up technical standards for the repair of shipping and motor vehicles, issued at various times over 180 standards for the repair of shipping and motor vehicles. To proceed with the work of harbor construction, we imported a number of dredgers and special equipment from abroad and directed our attention to the work of digesting, absorbing, copying and standardizing such equipment. We also issued a series of standards and regulations on harbor construction, the dredging of channels, highway bridges and culverts, planning and construction.

Between 1979 and 1980, the Ministry of Communications convened for the first time a national conference on the work of standardizing the communications system. Summing up its experiences in the work of standardization, the conference devised a work program for 1981 and 1982, formulated "Measures for the Control of Communications Standardization," cited 24 progressive

collectives and 22 individuals who had distinguished themselves in the work of standardization and laid a foundation for the further development of communications standardization. To meet the need for the development of inland river shipping, the Ministry of Communications directed its efforts toward the revision of the "Provisional Standards for Inland River Navigation in the Nation," the study of "A Series of Designs for the Construction of Barges in Separate Sections of the Changjiang River System" and the work of demonstration and formulation of standards. With a view to overcoming the problems posed by the lack of standardization in the products of the communications industry, the Ministry of Communications organized and participated in the work of standardizing special loading and unloading machinery for harbors, navigation marks, diving equipment and container freight shipping. In May 1980, the Ministry of Communications issued a "Notice Regarding the Setting up of Standards for the Enterprises" and requested the production enterprises to set up production standards and the transportation enterprise to set up transportation standards. In highway transportation, the ministry issued "Regulations for Highway Passenger Transportation" and "Regulations for the Inspection of Brakes of Motorized Vehicles," while in water transportation it issued "The System for the Technical Control of Harbor Loading and Unloading Machinery," "Basic Requirements for the Packaging of Goods for Waterway and Highway Transportation" and "Regulations Governing the Standard and Handling of the Quality of Water Used in Boilers of Shipping Directly Under the Ministry."

4. Between 1981 and 1983, following the 3d Plenum of the 11th Session of the Party Central Committee, the work of communications standardization underwent a new stage of development. With a view to implementing the strategic guiding principles of the 12th National Congress of the CPC, the Ministry of Communications formulated a program for the standardization of communications and compiled a chart showing the system of communications and transportation standardization according to the Sixth and Seventh 5-year Plans. At the same time, the Ministry of Communications engaged in a serious study of the policy of adopting international standards while setting up certain urgently needed standards for the nation, such as standards for fuel consumption of motor vehicles, standards for environmental conditions for transportation, general rules governing the berthing and trial runs of ocean and inland river shipping, standards for flares and signals used by ships standards for the measurements of tackles for container ships and their hoisting capacities and series, technical standards for the repair of motor vehicles and loading and unloading machinery in the harbors, standards for navigation marks and naval operations and standards for the codification of container ship operations.

II. Major Communications Standardization Achievements

1. Standardization of construction projects. Shortly after the establishment of the republic, a special standardization burea was set up by the Ministry of Communications. In 1956, the overall responsibility for the work of standardization was taken over by the Technology Department of the Ministry of Communications. In 1963, eight units under the Ministry of Communications in the Shanghai area, including the shipping and shipyard units and the

planning academy, set up a coordination committee for the standardization of shipping. This committee later became the technical unit responsible for the work of standardization. Since then, the Changjiang shipping system as well as the shipyards in Tianjin and Guangzhou have at various times established coordination committees to engage vigorously in the work of shipping standardization. Standards offices were set up by the Highway and Water Transportation Planning Academies. Units responsible for highway construction, shipping construction planning, construction work and scientific research were also set up to form a fledgling system for the work of communications standardization.

In 1975, the Ministry of Communications officially established the Standards and Measures Research Institute, which became the working unit responsible for carrying out the work of standardization of the Scientific and Technical Committee. This is the first research and administrative organ in history exclusively concerned with the promotion of communications standardization. By 1978, this office had a contingent of almost 50 workers.

To strengthen control over the work of communications standardization and to establish a contingent of specialized personnel, the party organization in the Ministry of Communications decided in 1983 to adopt two important organizational measures. The first was the establishment of the Standards and Planning Committee under the Ministry of Communications formed by the vice minister responsible for science and technology, those responsible for the concerned bureaus and standards offices and the concerned experts. This committee became the organ vested with overall authority. Plans are being made to establish under this committee nine specialized committees. Second, the original Standards and Measures Research Institute, which used to be on the departmental level, has been upgraded to the bureau level. Its leadership has been strengthened and its staff increased to meet the demands for the further development of transportation and production. At the same time, the checking and the consolidation of the enterprises under the Ministry of Communications and the vigorous readjustment and improvement of the basic work of management have served to promote the standardization of harbor and navigation units and the establishment of standardized organizations. By the end of 1983, a contingent of 300 specialized personnel engaged in the work of communications standardization had been established so that organized projects of construction were able to make speedy headway. Furthermore, the formulation and implementation of standardization laws and regulations in communications and the drawing up of standardization programs and charts for the standardization system have helped to push forward and give guidance to the work on an overall basis and to promote standardized projects of construction.

2. The formulation and promulgation of a series of standardization documents with special emphasis on communication and transportation have served to promote economic effectiveness.

With highway and harbor construction projects in mind, the Ministry of Communications set forth in the 1960's 60 specifications for planning and construction techniques, standards for checking quality before acceptance,

technical standards to ensure safety in shipping, quality standards in automobile production and standards for the products of the communications industries. In 1965, the Ministry of Communications issued a series of 84 standards relating to the technical aspect of shipping repair. By the end of 1983, the standards, specifications and regulations issued by the Ministry of Communications had increased from several dozen in the four large categories concerning highway construction, water transportation construction, motor vehicle transportation and shipping transportation in 1963 to 378 in 8 large categories, including basic standards in communications and transportation, loading and unloading machinery in the harbors, lifesaving and salvaging, navigation and navigation marks. In addition, the Ministry of Communications took the leading role in compiling 51 standards for the state, some 80 specific standards for shipping and regulations and systems of an administrative nature for communications, transportation and construction. The enforcement of these standards and documents has had a salutary effect in upgrading the quality of products and the standard of transportation, in meeting the demands for repairs and in increasing economic effectiveness.

In keeping with the spirit of "using the least number of designs to meet the widest range of needs" in the early 1970's to simplify and unify designs for shipping and machinery, we created favorable conditions for mass production at a lower cost according to the finalized designs. For instance, the berthing period of a 1.3-ton ocean-going freighter used to be 410 days before it was produced in large numbers according to a finalized design. This period was reduced to 159 days and the cost was cut by 7.2 percent after such freighters were produced in large numbers according to a finalized design. A 900-horsepower tugboat, which originally took 8 months to build, can now be built according to a finalized design in 4 months and at a 15.7 percent lower cost. The formulation and implementation of standards for building tugboats in separate sections have made it possible to reduce the construction period from the average of 30 days to 6 days.

In the early 1980's, we achieved a high degree of economic effectiveness by adopting a comprehensive set of standards relating to the use and maintenance of shipping, motor vehicles, loading and unloading machinery in the harbors and products of the Ministry of Communications. With the formulation and implementation of the "Technical Standards for the Repair of Motor Vehicles" issued by the Ministry of Communications, for instance, the number of major repair jobs that had to be done over again have been reduced from 16 percent to less than 5 percent and the engines, after major repairs, are as good or almost as good as new.

The ship designs that meet the 11 national standards set by "A Series of Yardsticks for Building Barges in Separate Sections in the Changjiang River System" compiled by the Ministry of Communications have become one of the major sources of reference for revising the "Standards for Inland River Navigation in the Nation." Many standardized ships have been built and put into operation. According to statistics, the construction cost of a barge built section by section ranges from 300 to 320 yuan for each ton of freight, whereas the construction cost of an ordinary barge ranges from 360 to 400 yuan. The transportation cost for the 100-ton class barge built section by

section is 7.08 yuan per 1,000 ton/km, whereas the transportation cost for a 120-ton ordinary barge is 14.9 yuan per 1,000 ton/km so that the transportation effectiveness of the former is obvious. The barges built section by section were awarded third prize in standardization achievement in the nation in 1981. The strengthening of the work of devising transportation and basic standards has yielded certain major results such as the formulation of basic standardization terms, technical terms and code names in communications and transportation and a series of designs for highway passenger cars and trailers for the transportation of freight throughout the nation. The Ministry of Communications also set up standards for fuel consumption for motor vehicles and shipping, containers and trays, transportation conditions and measurements of transportation packaging, navigation marks operations and flares and signals used by ships and equipment for throwing out ropes for lifesaving used on ships, etc. These standards, which are superior to those applying to industrial products, are being continually improved and developed.

3. Initial achievements in the adoption of international standards. The Ministry of Communications has achieved initial success in the adoption of international standards and advanced standards from abroad. For instance, by developing high-quality replacement parts patterned on imported replacement parts used in the chain-bucket type of dredgers, such as mud buckets, sleeves and the like, according to Japanese JIS standards, we have been able to use local and imported items interchangeably and to reduce the waiting time for repairs. One ship alone is capable of dredging about 300,000 cubic meters of mud per year, thus saving over \$3 million which would otherwise have to be spent to import spare parts. Again, on the basis of the IEC standard for "the application of the classification of environmental parameters and the degree of their severity," we have formulated national standards for "environmental conditions for transportation" while taking into consideration the circumstances of our country and the special features of our environment. We have also supplemented and modified the parameters relating to the types of climate, classification and the conditions of the machinery. The formulation of these standards will form the basis for the design, manufacture, packaging and testing of products and will have the effect of improving the quality standard of transportation and reducing the damage done to the merchandise. Furthermore, to meet the standards of the "international Convention for the Safety of Human Lives on the High Seas" (the "convention" for short) set by the International Maritime Organization, we have, after a great deal of scientific research, testing and verification, set up standards for the machinery for casting ropes used on ships for saving lives. This machinery has proved to be compact in structure, reliable, light in weight and small in size, all special features peculiar to our country. The major specific standards for this machinery, which has been approved by the Shipping Inspection Bureau, are higher than those set by the Convention and its technical capabilities are equal to advanced international standards. Our ocean-going vessels are now able to use locally produced products and to save at least \$500,000 a year for the state. Since 1981, the export of a small number of our products has earned a certain amount of foreign exchange.

4. The Ministry of Communications has put out standardization publications and has done well in publicizing and implementing the work of standardization and in rendering technical services. Since 1976, the publication "Communications Standardization" (renamed "Communications Standardization and Quality Control" in 1984) compiled by the Standards and Measures Research Institute of the Ministry of Communications has served to publicize and stir up interest in the standards set by the nation and the Ministry of Communications, the principles and policies of quality control, major conferences and important documents. The Ministry of Communications has also made known the revisions which have been made to standards set by the state and the Ministry of Communications and the experiences it has gained in the work of standardization. In addition, the Ministry of Communications has also published "Communications Standardization Developments in Foreign Countries."

In the field of technical services, the Ministry of Communications has edited and published standardization materials on shipping, roads and bridges, motor vehicles and trailers, loading and unloading machinery, containers and transportation. It has also collected and translated foreign transportation standardization materials (including diagrams and catalogs) to serve as sources of reference for the compilation of national and professional standards.

The Ministry of Communications has participated in the activities of 17 technical committees of the ISO. Up to the present, it has on 4 occasions sent a total of 10 delegates to attend professional conferences on container shipping and inland river navigation. By taking part in international conferences, we have been able to promote closer contacts and friendly relations with member nations, to gain first-hand experience, to collect materials and to play our role as a member nation.

III. Future Prospects

To realize the grand objective set forth by the 12th National Congress of the CPC and to bring about the modernization of our communications and transportation, we must, by using expressways and national defense and economic highway trunklines as mainstays, adopt new techniques to equip the highway network throughout the nation. We must also, by using the coastal waters, the Changjiang and the Beijing-Hangzhou Canal as a framework, construct and link up the water transportation network of the various major water systems. Regarding the development of communications standardization, the point of emphasis is to be placed on basic communications installations, the standardization of control, the vigorous adoption of international standards and advanced standards from abroad, the construction of communications and transportation facilities and equipment, transportation techniques, technical operations, transportation safety and the standardization of quality control in a scientific and modernized manner.

The work of communications standardization is just unfolding. The task is arduous and the road is long. We must continue to direct our efforts toward the emancipation of our minds and be determined to bring about reforms so that we may break new ground in our work of standardization and contribute to the modernization of communications and transportation.

TRANSPORTATION

CONSTRUCTION OF ZHANGPING-QUANZHOU RAILWAY IN FUJIAN REPORTED

Beijing TIEDAO ZHISHI [RAILWAY KNOWLEDGE] in Chinese No 4, 28 Jul 84 pp 10-11

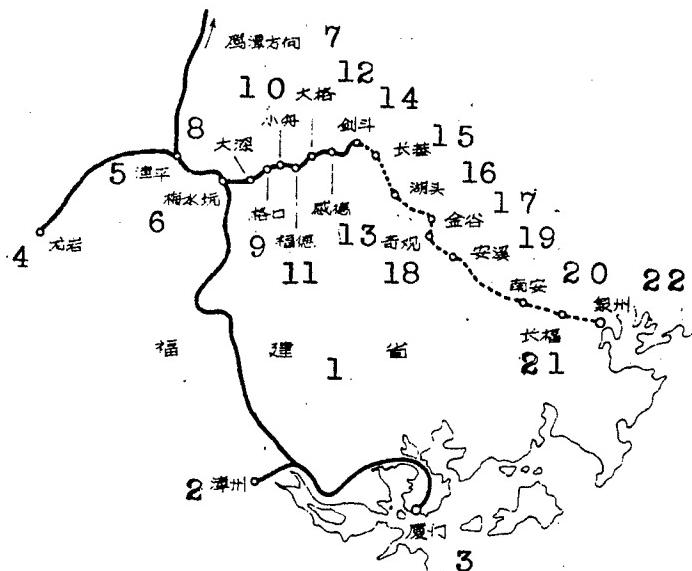
[Article by Zhou Bang [5297 6721]: "Zhang-Quan Railway, an Artery of Southern Fujian, Under Construction"]

[Text] In southeastern Fujian, a new railway, starting from the Jiulong Jiang, is now stretching toward Quanzhou Wan, which faces Taiwan across the strait. This railway, not yet completely shown on the map, is the Zhang-Quan Railway, now under construction. This is another artery of inland southern Fujian serving as a passageway to sea, next to the Ying-Xia and Lai-Fu Railways.

Passageway to Sea from Southern Fujian

The Zhang-Quan Railway starts in the west at Zhangping County in central-southern Fujian and ends at Quanzhou Municipality in the southeastern coast after passing through Anxi and Nanan Counties. This line branches out from the southern portion of the Ying-Xia Railway at Meishuikang Station 20 km south of Zhangping Station. After passing through Dashen, Gekou, Xiaozhou, Fude, Dage, Gande, Jiandou, Changji, Hutou, Jingu, Qiguan, Anxi, Nanan and Changfu, it terminates at Quanzhou Municipality, with a total length of 194 km. The first section of the Zhang-Quan line from Zhangping to Meishuikang, which is 20 km long, is actually part of the Ying-Xia line. The second section of 35 km from Meishuikang to Fude was completed in the winter of 1970, while the third section of 22 km was completed in 1981. A 20-km section between Jiantou and Hutou is now under construction, and the remaining 97-km section will be continued as a key project in Fujian Province. In addition, two special lines stretching from Quanzhou to the east and northeast will be built to form links with the important trading ports at Houzhu and Xiaocuo, while another branch line will be built to connect Changji with Xiayang in Yongchun for coal transportation.

When the Zhang-Quan Railway is completed and open to traffic, it will provide access to Eastern China and Central China through the Ying-Xia Railway in the north and form connections with the Longyan-Ganzhou Railway and the Logan-Meixian-Guangzhou Railway, all of which are in the planning stage now, in the west and with the Fuzhou-Xiamen Railway, also in the planning stage, in the northeast and the southwest. This network of railways will bring the



Sketch Map of the Zhang-Quan Railway

Key:

- | | |
|--------------------|--------------|
| 1. Fujian Province | 12. Dage |
| 2. Zhangzhou | 13. Gande |
| 3. Xiamen | 14. Jiantou |
| 4. Longyan | 15. Daji |
| 5. Zhangping | 16. Hutou |
| 6. Meishuikang | 17. Jingu |
| 7. To Yingtan | 18. Qiguan |
| 8. Dashen | 19. Anxi |
| 9. Gekou | 20. Nanan |
| 10. Xiaozhou | 21. Changfu |
| 11. Fude | 22. Quanzhou |

hinterland within the reach of the southeastern coast and will play an important role in exploiting Fujian's economic resources, promoting industrial and agricultural developments in the southeastern region, boosting foreign trade and bringing prosperity to the market besides developing tourism and facilitating contacts across the strait with a view to speeding up the return of Taiwan to the motherland.

Landform and Technical Standards of the Railway

The Zhang-Quan Railway runs across the inland of central-southern Fujian which consists of mountains, hills, plains and rivers. The railway runs east along the Dashen Xi, a branch of the Jiulong Jiang, vaults the southern part of Daiyunshan, crosses the Xi Xi at the upper reaches of the Jin Jiang and then stretches southeast along the Xi Xi and the Jin Jiang until it reaches the Quanzhou plain at the coast. There are many high mountains and steep cliffs in its western section. From Meishuikang to Hutou, the ground is covered with greyish white, light grey and deep brown granites. Southeast

of Hutou are mostly mountains and hills. Along the valley of the Xi Xi runs a narrow strip of flatland forming a basin in the shape of a string of beads. On both banks are steep cliffs and sharp slopes with marked faults in the landform. The hills disappear beyond Changfu. Then within the precincts of Quanzhou, there is a wide expanse of flatland with the typical characteristics of an alluvial plain. All along the railway, the population is large and the land is scarce. The villages are closely grouped together and in some communes, the average land area per capita is only 3 fen.

Bearing in mind these geographic characteristics, the designers carefully inspected the landforms and conscientiously surveyed and selected the sites. They not only adhered to the principle of encroaching on the farmland or demolishing the houses as little as possible but also avoided any adverse effect on the quality of the railway. That is why the design called for many curves, bridges and culverts. Although the distance between Hutou and Quanzhou in a straight line is only slightly more than 70 km, there are as many as 115 curves and the total length of these curves makes up half of the railway's total length. To ensure the safety of the train, the pedestrians and the cattle, and for the convenience of the people crossing the track or irrigating the farmland, 50 flyovers and 276 culverts were built between Hutou and Quanzhou. At the same time, 16 large and medium-size bridges were built, for a total length of more than 2,400 meters. The Jinji Bridge across the Jing Jiang, more than 540 meters long, is one of them. On the Jiurishan located at one end of the Jinji Bridge is an important historical site--the engraved "Qifeng [Praying for Wind]" stone commemorating our overseas contacts in ancient times. To preserve this precious relic, the 521-meter Jinji tunnel had to be cut for the train to pass through. Furthermore, in the section between Meishuikang and Jiandou, which is now open, 23 bridges have been built and 38 tunnels dug. Between Gekou and Xiaozhou, there is the Wigui Bridge with a pier as high as 54 meters. Since such a height is rather uncommon, this bridge has been included in the album of bridges with typical Chinese characteristics. By the side of Jiandou Station, the digging of the Xikangzi tunnel, which will be more than 4,600 meters long, has begun.

The Zhang-Quan Railway is classified as a third-grade line, according to its technical conditions and the estimated traffic volume. The minimum length of the radii of the curves is 300 meters; the limiting gradient, 6 per thousand; and the difficult portions, 12 per thousand. The "Jiefang" steam locomotives first used were replaced later with large "Qianjin" locomotives. The annual traffic volume is 5 million tons now and will be the same for some time to come. It will be increased to 8 million tons in the distant future.

Products and Resources of Areas Served

The Zhang-Quan Railway runs mostly along the drainage basin of the Jin Jiang, and the sphere of its operation includes Zhangping, Anxi, Yongchun, Dehua, Nanan, Jinjiang and Quanzhou counties and municipalities. This region is set against a background of mountains and faces the sea. The climate is warm with plenty of rainfall and the products are abundant. The major agricultural and sideline products are rice, sweet potatoes, sugarcane, wheat, tea, peanuts, hemp, longan, lichee, tangerines, olives and other subtropical fruits. Fujian

is one of the three national forestry areas. It has abundant forestry products such as rapeseed, resin, tung oil and palm fibers. Among the many varieties of tea produced in Anxi is the famous "Tieguanyin [Iron Buddha]" commonly known as "green leaves with golden edges which retain their fragrance even after six changes of boiled water." It is selling well in more than 30 countries and regions of the world and is particularly welcomed by overseas compatriots in Hong Kong, Macao and Southeast Asia. Jinjiang produces large quantities of scallops, razor clams, oysters, laver and other sea products.

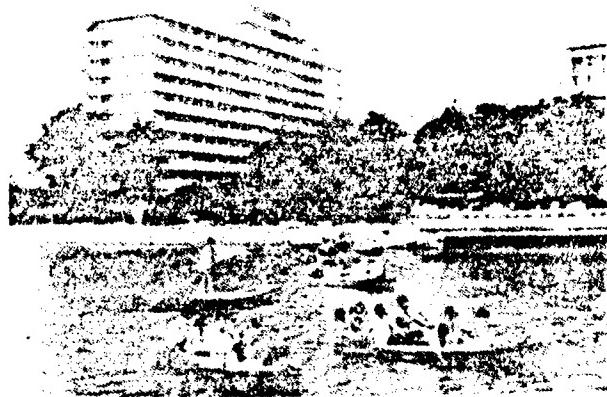
The areas along the railway track also produce iron, coal, molybdenum, tungsten, manganese and sulphurous iron. The Panluo iron mine is one of a few mines in the country producing ores for open hearths. The tungsten ores of Zhangping are of fine quality and are used for export. In Yongchun, the Tianhushan coal mine is one of the important bases of anthracite production in Fujian. Granite is abundant in many areas along the railway track. They are high-grade building materials and their processing by the ingenious craftsmen of Huian and other places further enhances their value. The deposits of limestone and porcelain clay are also very plentiful. Since their covering layer is not thick, they can be easily extracted. All these natural resources are of great interest to overseas traders.

Industry is also flourishing in the counties and municipalities along the route. Zhangping is one of Fujian's important industrial bases, engaging mainly in mining and tunneling in addition to the timber industry. Dehua County is well known for its porcelain and enjoys a good reputation as the "Jingdezhen of Fujian." The porcelain produced here has a smooth and lustrous surface with a high degree of transparency and an attractive appearance. They are selling well in various parts of the world. Quanzhou mainly produces light and textile products including foodstuffs, chemicals, machinery and textile goods. Its arts and crafts have a long history and are well known for their workmanship. Its wood sculptures, artificial flowers, embroidery, bodiless lacquerwares, puppet heads, woven bamboos and colored streamers all enjoy brisk sales in many countries of the world. The preserved products of Yuanhetang and the "Shenchu" [medicinal tea] of Laofanzhi are also well known in overseas markets. Yongchun's embroidered paper pictures and lacquer containers are also well known.

Quanzhou: the Famous Native Land of Overseas Chinese

Quanzhou Municipality, at the terminus of the Zhang-Quan Railway, is an ancient city with a long history. It was well known far and wide back in the dynasties of Song and Yuan and was called one of the largest trading ports of the world. It was visited by the famous traveler Marco Polo, while Mohammed sent his disciples, the Third Wiseman and the Fourth Wiseman, here to do missionary work. Zheng He, the famous navigator of the Ming dynasty, sailed beyond the South Seas on seven occasions and, on five of these occasions, came to Quanzhou to pray for supernatural assistance. This place is now the famous native land of overseas Chinese of the southeastern coast. The population of this city is close to 400,000 of which more than 40,000 are returned overseas Chinese and their relatives. In addition, 50,000-60,000 overseas

Chinese have returned each year to visit their relatives and friends and to sightsee or to engage in business negotiations. Along the railway in the city are many houses occupied by overseas Chinese relatives, all built with new and attractive architectural designs. There are also universities, secondary schools and elementary schools for overseas Chinese students.



Quanzhou's Overseas Mansion



Eastern and Western Pagodas of Quanzhou

Quanzhou is also a tourist spot because of its scenery and many historic sites. In the eastern part of the city is the Kaiyuan Abbey, a famous monastery in Fujian. It was first built in the Tang dynasty and developed into hundreds of branches in the Song dynasty. The major structures still remaining are the Daxiong Precious Palace, the Elixir Altar of Abstinence and the Eastern and Western Pagodas. The palace structure presents an impressive spectacle. In

the system of brackets between the top column and the crossbeams are carved the "flying musicians," and on a platform in front of the palace is a fairly unique relief sculpture of a lion with a human face. East of the monastery is a museum showing the history of Quanzhou's overseas communications and inside the museum can be seen the seagoing vessels of the Song dynasty, some unearthed relics, the religious stone carvings of Islam and other sects in the Song dynasty and exhibits of both ancient and modern porcelain for the overseas market. All these show how the friendly contacts and economic and cultural exchanges between Chinese and foreign peoples were formed in ancient times. Qingzhen Monastery on Tumen Street in the city was built in the early Song dynasty. This is one of the earliest Islam monasteries which still remain in China and is being preserved as one of the key national cultural objects. Its major structures are the main gate, the Fengtian Altar and the Mingshan Hall. Inside the monastery are engraved passages from the Koran in Arabic. Qingyuanshan is located in the northern suburbs. It has luxuriant foliage and towering rocks and is called the "first mountain in the fairyland of the Fujian Sea." On the mountain are nearly 200 cubic meters of engraved stones left over from the Song, Yuan, Ming and Qing dynasties. On the right peak is the Grand Master's Rock, out of which a portrait of the Grand Master is carved. It shows the kind face of an old man with flowing beard and is a piece of rare sculpture of the Daoist sect of the Song dynasty.



Grand Master's Rock in Quanzhou

There are also other historic sites and scenic spots in Quanzhou, such as the Tianhou Palace, the home of Li Zhi, the Caixiang Shrine, the Dong Hu, Luoyang Bridge, Baiyuan Chuandi and so forth, all of which are fascinations for tourists.

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TRANSPORTATION

TIANSHUI-LANZHOU RAILWAY IN GANSU REPORTED ELECTRIFIED

Beijing TIEDAO ZHISHI [RAILWAY KNOWLEDGE] in Chinese No 4, 28 Jul 84 pp 2-3

[Article by Feng Jinzhu [7458 6855 2691]: "Tian-Lan Railway: Electrified Trunk Line to the Great Northwest"]

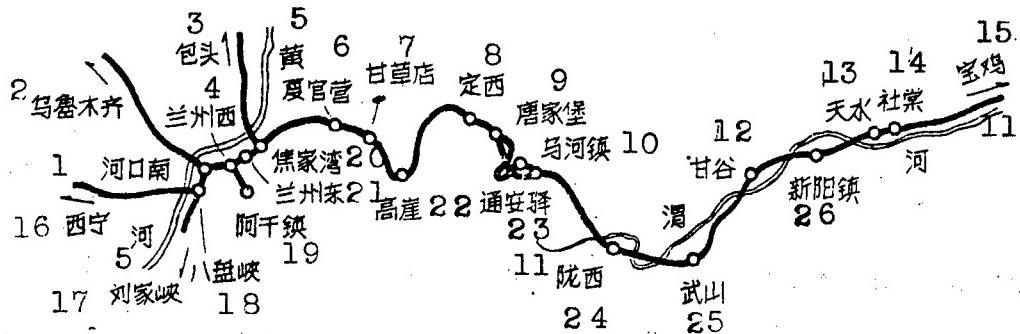
[Text] After more than 3 years of hard struggle, the electrified section between Baoji and Tianshui has been extended west all the way to Lanzhou and was opened to traffic on 1 May. From now on, the Longhai Railway will be like a tiger with wings which will bring the Great Northwest within our easy reach.

The Tian-Lan railway starts in the east from Tianshui, an important industrial city in eastern Gansu, and ends at Lanzhou, Gansu's provincial capital in the west, after passing through Gangu, Wushan, Longxi and Dingxi, for a total length of 354.25 km. The Northern Warlords had this railway surveyed back in 1914, and the Kuomintang government started work on it in 1946. Up to the time of National Liberation, however, it had only built a small railroad bed and cut several tunnels but had not laid a single rail. On the map, this railway still appeared as a dotted line. After Liberation, the Northwest Railway Trunk Line Engineering Bureau began construction, and after 2 years and 4 months, the railway was completed ahead of schedule and opened to traffic on 1 October 1952. In the railway network, the Tian-Lan section of the Longhai Railway is now connected in the east with the Bao-Tian section, which leads all the way to Lianyungang; and in the west, it is connected with the Bao-Lan, Lan-Xin and Lan-Qing Railways and becomes an important passageway to the Great Northwest. In recent years, because of rapid national economic development, the transport capacity of this railway is far from adequate for the traffic volume. Therefore, based on the unique resources of hydropower possessed by Gansu Province, the state decided in 1977 to carry out technical transformation on this railway through electrification, which was listed as one of the national key projects.

Creating Conditions for Developing Great Northwest

The three provinces of Gansu, Xinjiang and Qinghai have spacious territories, while rich energy resources and mineral deposits are scattered all over the rich agricultural and herding areas. (China has five large herding areas and in this region are three of them.) Tens of millions of kilowatts of

Sketch Map of the Electrified and Double-track
Tian-Lan Section of the Longhai Railway



Key:

- | | |
|--------------------|---------------------|
| 1. Southern Hekou | 14. Shetang |
| 2. Urumqi | 15. Baoji |
| 3. Baotou | 16. Xining |
| 4. Western Lanzhou | 17. Liujiaxia |
| 5. Huang He | 18. Bapanxia |
| 6. Xiaguanying | 19. Aganzhen |
| 7. Gancaodian | 20. Jiaojiawan |
| 8. Dingxi | 21. Eastern Lanzhou |
| 9. Tangjiabao | 22. Gaoya |
| 10. Mahezhen | 23. Tonganyi |
| 11. Wei He | 24. Longxi |
| 12. Gangu | 25. Wushan |
| 13. Tianshui | 26. Xinyangzhen |

hydropower are available for exploitation, and along the main course of the Huang He near Lanzhou, eight large and medium-size power stations, including those in Liujiaxia, Yanwuxia and Bapanxia, have been built. They have a combined capacity of millions of kilowatts. After the completion of the Longyangxia power station in Qinghai, the installed capacity was further increased. This area also contains very rich oilfields which are distributed from Tacheng and Karamay in Xinjiang to Yumen and Yongchang in Gansu and from the Junggar Basin and Tarim Basin to the Qaidam Basin. Here are deposits of more than 100 billion tons of coal, scattered all over the place, huge salt deposits which are rare in the world and a reserve of long-fiber asbestos which ranks first in the country. There are also the gold mine of Altai, the nonferrous metal mine of Qilinshan and the jade mine of Kunlunshan and Hetian, all with rich deposits. The Great Northwest is a treasure land waiting to be developed according to our four modernizations program. Last year, the leading comrades of the central authorities inspected this region and said that by the turn of the century, the focus of our economic development will certainly be shifted to the Great Northwest, which will become one of the most important bases in our country in the 21st century. That is why the electrification of the Tian-Lan section is of great significance in the development of the Great Northwest's resources, in accelerating economic development and strengthening national defense and in creating the conditions for shifting the focus of national construction to the Great Northwest.

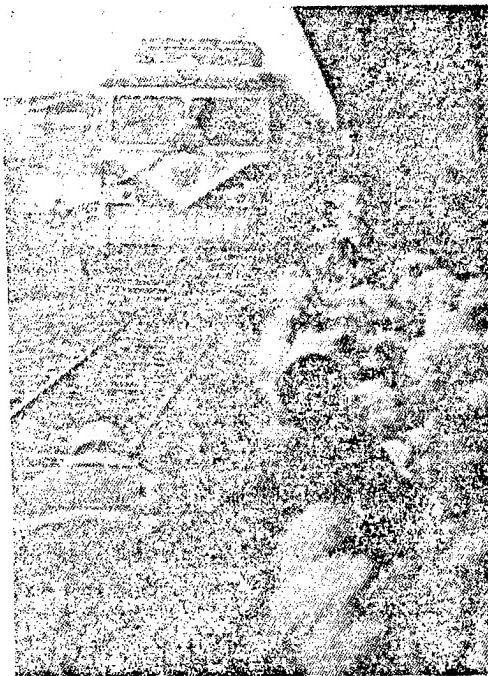
Taking on a New Appearance

The Tian-Lan Railway is located in the Longshan range along steep cliffs. It is more than 3,000 meters above sea level and crosses the Wei He six times on the way. It runs along the Wei He valley, the Huang He valley and the loess valley formed by some branch streams; crosses two watersheds in Daying-liang and Chuercha; and then winds its way along the valleys and streams, over many bridges, through many tunnels and around many curves. There are 378 curves of a total length of 122.3 km, and 99 of them, in the past, had radii of less than 350 meters. There are also 1,013 bridges and culverts of different sizes. Some of the bridges span deep gullies hundreds of feet deep, while others span the muddy Wei He. The railway also goes through 54 tunnels with a total length of 15,438 km, the longest one--the Songshawan tunnel--measuring 2,224 meters. The greater portion of the Tian-Lan Railway has a single track; only the sections between Tonganyi and Rongjiawan and between the east and west stations in Lanzhou have double tracks. The largest gradient is 12.5/1,000. There are 45 stations, but only a small number of them have effective lengths of arrival-departure tracks of 810 meters or more, while all the rest had been between 608 and 720 meters. The entire line had been built of 43-kg steel rails. On the whole, the railway's conditions are poor.

Technical transformation through electrification has improved some of these conditions. Fifty-kg steel rails are now used, the effective length of arrival-departure tracks in the stations have been extended to 810 meters and the radii of all curves are now more than 300 meters. Semiautomatic relays are used in the blocking system, electricity and gas in all stations are centrally controlled and the open wires of the signal system have been replaced with underground wires. Throughout the line, there are altogether nine traction transformation stations, in which electricity is centrally supplied. Each station has two single-phase transformers and one mobile transformer is used as a reserve for the entire section. In the stations located more than 1,500 meters above sea level, all the electrical appliances of 110 kv, such as the main transformer and the mutual inductor of voltage, are of the plateau model. All suspensions are simplified throughout the line. Epoxy resin insulators are used in the tunnels, while booster transformers have been installed near the large and medium-size cities. Some new technologies and new equipment have also been introduced in the electrified section. For example, the single-phase transformers are all connected for parallel operations, which makes it not only feasible for the transformers' capacity to be fully utilized but also more convenient for the connections to be made. Low-capacity alkaline battery cells with silicon rectifier switches now replace low-capacity acid battery cells. Transistor protectors have been installed and test instruments are being used for detecting defects in the central signaling system and the electrification power lines. The isolating switches are now power operated.

This railway has taken on a different appearance after its electrification, since both the hauling capacity of locomotives and the transport capacity of the railway have been markedly increased. Formerly, a single steam locomotive could haul 1,400 tons up and down, and a double locomotive could haul 2,700

tons up and 2,200 tons down. After electrification, a single locomotive will be able to haul 2,400 tons in the immediate future while a double locomotive will haul 3,250 tons in the distant future, thus increasing the hauling capacity by 71.4 percent and 47.7 percent, respectively. The transport capacity will also be raised from 9 million tons to 12 million tons in the immediate future and to 17 million tons each year in the distant future, a 35.5 percent and 88.9 percent increase, respectively.



Tian-Long Section of the Tian-Lan Railway Electrified and Open to Traffic
(Photograph by Shen Peide [3947 1014 1795])

Ancient Cities and Historic Relics Along the Line

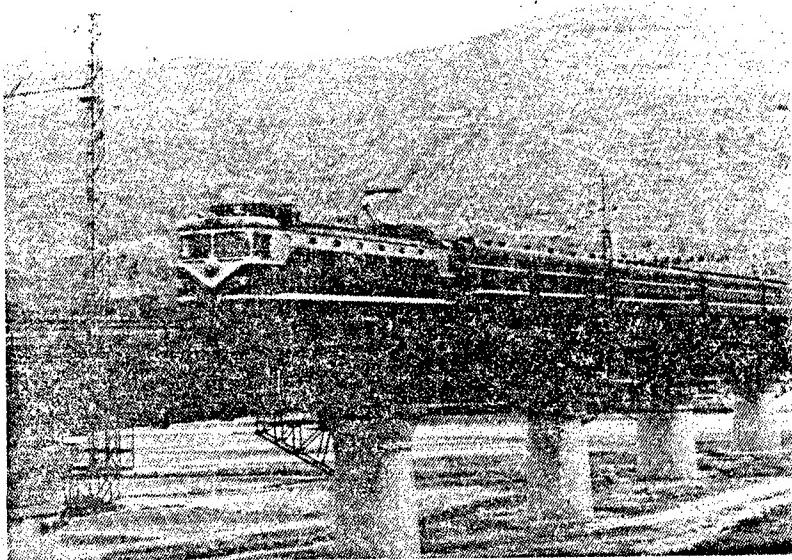
Lanzhou is the terminus of the Tian-Lan Railway. It has since ancient times occupied an important position in communications between the central plain and the northwest. It is also traversed by the historic "Silk Road" which was used by imperial envoys Zhang Qiang of the Western Han Dynasty and Ban Chao of the Eastern Han Dynasty on their way to and from the western territory; by Xuan Zang of the Tang Dynasty on his pilgrimage to India for the Sutra; and by the famous traveler Marco Polo of Italy in the 13th century. After the Tian-Lan, Lan-Xin, Bao-Lan and Lan-Qing Railways were opened to traffic, Lanzhou's position became even more important. In Gansu Province, it has become the political, economic, cultural and communications center and has developed into a comprehensive industrial city with petroleum refining, chemicals, machine building, metallurgy, woolen textiles and instruments and meters as its major industries. Among the famous historical sites are the Wuquanshan, the Baitashan, the Yantan and the Bingling Grotto. Many kinds of melons and fruits are produced in the vicinity of Lanzhou which has long been well known as the "native land of melons and fruits."

Tianshui Municipality is the starting point of the Tian-Lan Railway. It is located in eastern Gansu and on the south bank of the Wei He. As a historic city, it has long been the political and economic center of eastern Gansu as well as an important passageway and strategic point for the three provinces of Gansu, Shaanxi and Sichuan. Now it has become an important industrial city of the province. Its main industrial products are woolen textile goods, machinery and electrical appliances and materials. Its ready-made Chinese medicines, plastic wares and artistic objects are also well known, and its carved lacquerwares are particularly famous at home and abroad. Tianshui has many scenic historic attractions for foreign as well as Chinese tourists. At the western gate of the downtown area is the Fuxi Temple built in the 3d year of Minghong in the Ming Dynasty, with a history of more than 400 years. Approximately 30 km southeast of the city is the Maijishan Grotto, also well known at home and abroad as the "great sculpture mansion of the east." Some 10 km from Maiji is the Fairy Cliff, where, according to tradition, fairies paid their homage to God. Below this steep cliff are many temples in which the Buddha statues look as though they are alive. Shimen is 50 km from the Tianshui railway station. Here the mountains form a vast expanse of verdant splendor with many towering peaks. On a misty day, the hazy landscape seems to change mysteriously like a fairyland. Two and half km southeast of Tianshui city is the Nanguo Monastery half way up a mountain. Inside this monastery is the statue of Du Fu in a small shrine surrounded by old cypresses and Chinese scholar trees. This place deserves to be called "one of Tianshui's attractions." On the slope of Wenshan in the southern suburbs is the tomb of Li Guang, the Flying General of the Western Han Dynasty. Li Guang has been hailed as a national hero for thousands of years because of his resistance against foreign aggression.

Lu Ban village is approximately 25 km northeast of Wushan County Seat. It is on a towering mountain among luxuriant trees. In the arid hilly regions north of the Wei He is a rare sacred place--the Shuiliandong Grotto which includes five scenic historic sites, namely, Xiansheng Lake, Laxiao Monastery, Qianfu Cave, Shuilian Cave and Sanqing Cave. Xiansheng Lake is located at the mouth of a gully. Here a spring spurts out from underground to form a stream which flows 20 km into the Wei He.

Weiyuan Mansion is located at the center of the county seat of Longxi. It has a brick foundation, a pedestrian corridor and three layers of upturned eaves. People at the upper floor can have a full view of the Hei He and Longshan.

People riding a passenger train hauled by an electric locomotive can enjoy the scenery of historic sites and the beautiful landscape all the way. These attractions will certainly be a source of inspiration for them to undertake the four modernizations and to develop the Great Northwest.



An Electrified Locomotive Hauling a Passenger Train Across the Wei He
(Photograph by Dong Haiwang [5516 3189 2489])

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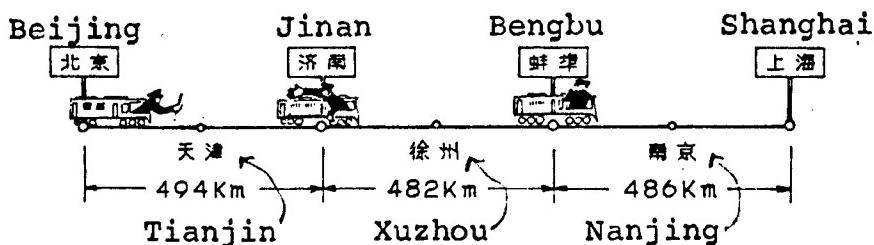
TRANSPORTATION

TWO RAILWAY TECHNICAL TERMS INTRODUCED

Beijing TIEDAO ZHISHI [RAILWAY KNOWLEDGE] in Chinese No 4, 28 Jul 84 pp 8-9

[Article by Pu Jiwu [5543 4764 2976]: "Locomotive Routing and Crew Change System Briefly Introduced"]

[Text] Passenger and freight trains are running day and night throughout the country, but the locomotives can haul them only by sections. The operation is like a relay race in which the locomotive is the runner and the train the baton. A train running from Beijing to Shanghai takes 19 hours and 29 minutes over a distance of 1,400 km and has to be hauled by three locomotives in succession. At the Tianjin, Xuzhou and Nanjing stations, the train stops for 4-6 minutes, but at Jinan and Bengbu, it has to stop for 12 minutes because of the locomotive change. A train carrying coal from the place of production, Datong, to Guangzhou has to cover a distance of more than 2,600 km, which is divided into 12 sections, and has to be hauled by different locomotives. The distance covered by one locomotive is called, in railway terminology, a "locomotive routing," which is defined in the "Regulations of Locomotive Operation" as a "locomotive's turnaround zone."



After the change to long routing, the passenger train from Beijing to Shanghai needs only two locomotive changes en route and the duration of the trip is shortened by more than 6 hours.

Long Routing

Locomotive routing is an important factor in the organization of railway transportation because the length of routing has an important bearing on transportation efficiency and economic results. The conditions determining the routing are also very complex and require an overall study of the distribution of engine terminals and the locations of passenger and freight

terminals and marshaling yards. But the major restricting factor is the distance over which a locomotive, after being serviced, can continue to haul a train. For example, a Qianjin steam locomotive with six axles, now commonly used in our country, has to carry 22 tons of coal and 50 tons of water for its own consumption. If it hauls a 3,500-ton freight train up a gentle slope, it has to replenish its water supply and clean out the cinder box after running every 70-80 km, and to replace the coal already consumed and to lubricate the mechanical parts after running every 150-180 km. These servicing jobs are commonly completed in the engine terminal or turnaround depot and normally require at least 30 minutes. In order that the train does not have to wait too long for the locomotive, another locomotive has to be prepared in advance as its substitute in order to continue the trip, while the locomotive that has been replaced will take on a fresh supply of coal and water and be used to haul another train on a return trip. In railway terminology, this is called a "turnaround." Because of objective conditions, the routing of a steam locomotive is generally limited to 150-200 km with an average of 192 km for passenger locomotives and 151 km for freight locomotives.

Diesel and electric locomotives have many advantages in this respect. Power for electric locomotives is supplied from external sources through electrification power lines. They require no coal and water and there are no boilers to be cleaned. After each servicing, they can haul trains continuously for tens of hours over a distance of 2,000-3,000 km. Diesel locomotives need diesel oil on board, but according to the present conditions of railway operations in our country, the capacity of oil tanks of the "Beijing" model for passenger transport and the "Dongfeng" model for freight transport is sufficient to cover a distance of 800-1,000 km, 3-4 times that of steam locomotives. In contrast to the shorter routing of steam locomotives, their routing is commonly called "long routing."

The adoption of long routings will greatly reduce the number of locomotive changes and the time en route, increase the utilization of trains and speed up the flow of materials, thus achieving greater economic results in railway operation and in the national economy as a whole. Therefore, the use of long routings for diesel and electric locomotives is an inevitable trend. Only through such a reform will it be possible for the new motive power to demonstrate its superiority.

After the improvement in motive power among many advanced railways in the world, the length of locomotive routing is generally extended to about 1,000 km and, in some cases, 3,000 km. The routing of a U.S. locomotive from Chicago to Los Angeles is more than 3,522 km.

Our country is actively developing diesel and electric locomotives which now account for approximately 30 percent of the total number of locomotives. Since 1975, many railways have used long routings with very good results. Formerly, for example, a passenger train from Beijing to Shanghai hauled by a steam locomotive had five routings, averaging 292 km each, and requiring four locomotive changes enroute. Now, the number of routings for a diesel locomotive is only three, averaging 487 km each, and the entire trip requires only two locomotive changes. The traveling time has also been reduced from

26 hours in the past to 19 hours 29 minutes. The number of routings for a passenger train from Beijing to Guangzhou, a 2,313-km trip, has been reduced from 10 to 5, averaging 462 km each, and the longest is 726 km from Changsha to Guangzhou. The number of locomotive changes has been reduced from nine to five, and the traveling time from 43 hours 14 minutes to 33 hours 27 minutes. These comparisons vividly show that the popularization of long routings is the key to bringing the superiority of the new motive power into play.

The major technical policies formulated in 1983 for railways called for the popularization of long routings for diesel and electric locomotives precisely because of their importance and inevitability.



The pilot of the diesel locomotive Dongfeng 0109 briefing the ground crew before going off duty and prior to the return trip from Shaoguan to Guangzhou.

Crew Change System

The personnel driving or taking charge of the locomotive are called the locomotive crew. For a steam locomotive, the crew consists of three persons, namely, the pilot, the copilot and the boiler attendant. For a diesel or electric locomotive, no boiler attendant is required. These three, or two, persons form a crew and when three or four crews are specially assigned to one locomotive, it is called the "responsible crew system." When several crews from one or more engine terminals are scheduled to operate a locomotive within their own section or zone in rotation, the practice is called the "crew change system."

The responsible crew system has been in use since 1949 in our country for steam locomotives. The time of routing for steam locomotives is short, generally 8-10 hours, exactly enough for one shift of work. Since the boiler's mechanical parts require timely inspection, it would be advantageous to entrust its operation to the specially assigned crews so that they could become familiar with the characteristics of the boiler and take good care of it. Thus for more than 30 years, the system of the responsible crew system has

been used for our steam locomotives. This crew-scheduling system was based on objective realities and has proved to be very effective. It should be continued for our steam locomotives in future, and Article 111 of "Regulations of Technical Railway Management" must be followed.

Long routings should be used for diesel and electric locomotives. Since each trip covering 1,000 km will require more than 20 hours and the working time of each crew can only be 6-8 hours, two or three crews will be required in rotation for each routing. If the same system of responsible crews for steam locomotives is to be used, then the routings cannot be extended, and the job of crew scheduling will also be difficult. Only the crew change system can solve the problem. Under this system, there will be crew changes without any locomotive change, and the crew of several engine terminals can operate one locomotive section by section in rotation while the same locomotive continues its trip. Furthermore, since the crew changes usually take place at the larger stations, they generally require only 10-14 minutes. The 726-km routing from Changsha to Guangzhou, as mentioned earlier, was undertaken by two crews of the Changsha and Guangzhou engine terminals in rotation. Therefore, the crew change system is the natural outcome of long routings, and the two are closely related, each providing the necessary conditions for the other.

After the adoption of the crew change system, the inspection and servicing at each terminal should be jointly undertaken by expert crew members and the maintenance crew (or the "ground crew"), and a strict system of handing over and job responsibility should be instituted. This will ensure the good performance of the locomotive and at the same time enable the crew to concentrate its energy on the operation in the interests of safety and timely departures and arrivals.

Under the crew change system, crew scheduling and locomotive dispatching can be carried out separately and with greater flexibility. The time for the crew members' work, rest and study can be well balanced, and the schedule, once worked out, can remain effective for several weeks without alteration.

The crew change system has undergone great development in foreign railways precisely because of its marked superiority. The United States adopted this system back in the days of steam locomotives, while railways in the Soviet Union, according to a decision by the Ministry of Communications, made all-out efforts in 1960 to adopt long routings and the crew change system.

In our railways, the use and management of diesel and electric locomotives have already had a history of 20 years. These locomotives now account for 30 percent of the total number and are handling the major portion of passenger traffic and 25 percent of the freight traffic. Yet, for a long time, we invariably have used the management system suitable only for steam locomotives, and it was not until 1975 that trial use of the crew change system began in nine engine terminals at Baoji, Mahueba, Xichang, Emei, Changsha, Guangzhou, Shanhuaiguan, Shaoguan and Taiyuan. Eight years of practice have fully demonstrated the superiority of this system. In 1983, this system was adopted in eight other engine terminals at Liuzhou, Shuicheng, Shijiazhuang, Jinan,

Shanghai, Liuyuan, Shenyang and Rongan, all with remarkable success. Thus by the end of 1983, this system was adopted by 17 engine terminals, or 32 percent of all diesel and electric engine terminals. On the basis of continued practice and continued summation of experiences, this system will be further expanded to include more than 20 engine terminals this year so that by the end of 1985, this reform will be basically completed in all railways.

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TRANSPORTATION

DOUBLE TRACKING OF JIAOXIAN-JINAN RAILWAY REPORTED

Beijing TIEDAO ZHISHI [RAILWAY KNOWLEDGE] in Chinese No 4, 28 Jul 84 pp 4-5

[Article by Wang Shixiang [3769 0013 7449] and Cao Shanfu [2580 0810 4395]: "Double Tracking of Jiao-Ji Railway, an Important Trunk Line Traversing Shandong Peninsula"]

[Text] A double track is now under construction for the Jiao-Ji Railway, an important trunk line along our southeastern coast. It starts at Qingdao in the east, passes through Lancuan, Jiaoxian, Weifang, Yidu, Zhangdian and Zhoucuan and ends at Jinan in the west, 393 km long. This railway joins the Jin-Pu line in the west and makes contact with Qingdao harbor in the east. Along the route, it is connected with the branch lines at Zhangbo, Zhangdong, Xintai and Lanyan. As the only trunk line traversing the Shandong Peninsula, it handles the passenger and freight traffic of the majority of areas in the province.

Course of Tragic Events

The history of the Jiao-Ji Railway reflects an aspect of the long national struggle by China against foreign aggression.

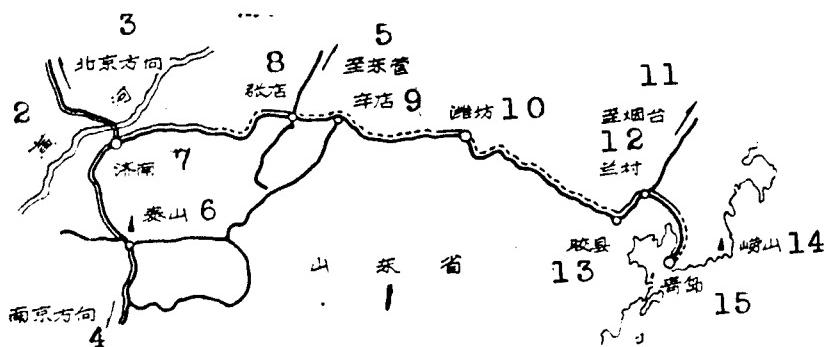
Back in 1887, Germany dispatched troops to seize Jiaozhou Wan under the pretext that two German missionaries had been killed. At the same time, it demanded the lease of Jiaozhou Wan and the rights to build railways in Shandong. In March 1898 (2d month of the 24th year in the reign of Guangxu), the corrupt Qing government signed with Germany the "Jiao-Ao Lease" and recognized Germany's lease of Jiaozhou Wan for 99 years as well as its right to build two railways--the Jiao-Ji and Jiao-Yi Railways--and its mining rights within 30 km on both sides of the railway tracks.

The Jiao-Ji Railway was constructed with investments by 14 German banks. Beginning in October 1899, the "Shandong Railway Company," organized with special permission from the German government, was in charge of the construction. A large number of Chinese workers were forced to offer their cheap labor. These workers were wantonly oppressed and exploited by the German supervisors and foremen and had to toil like slaves and suffered casualties every day. Wherever the railway went, the Germans took over the farmland at will, destroyed the irrigation facilities, razed villages to the ground

and shot civilians. The peasants of Gaomi County found the situation intolerable and rose in revolt. Yuan Shikai, the Grand Inspector of Shandong, betrayed the nation for his own personal glory and sent troops to assist the aggressors in suppressing the peasants who were only defending national sovereignty. Thus, the Jiao-Ji Railway under construction was soaked with the blood and tears of Shandong's people.

The Jiao-Ji Railway was completed in July 1904 and its operation formally began in 1905. In September of the same year, a branch line between Zhangdian and the Boshan coal mine was built. When World War I broke out in 1914, Japan seized the opportunity to take over German interests in China. It also took over control of the Jiao-Ji Railway, changed its name to the "Shandong Railway" and began the unbridled plundering of Shandong's mineral resources. This railway was bought back by our country in 1925, but Japan still retained its power over traffic direction and financial matters. In 1938 [as published], Japan launched its war of aggression against China, and this railway once again fell into Japanese hands. In 1945, after our victory in the War of Resistance against Japanese Aggression, the Kuomintang government took over this railway and used it to launch large-scale attacks on the liberated areas. In both the War of Resistance and the War of Liberation, this railway became the scene of fighting. The soldiers and civilians in Shandong destroyed roads and bridges and won brilliant victories in their brave struggles. But it was not until the liberation of Qingdao on 2 June 1949 that this railway returned to the people's embrace and its tragic history ended. The whole line was reopened for traffic on 1 July of the same year.

Sketch Map of Jiaoxian-Jinan Railway



Key:

- | | |
|----------------------|---------------|
| 1. Shandong Province | 9. Xindian |
| 2. Huang He | 10. Weifang |
| 3. To Beijing | 11. To Yantai |
| 4. To Nanjing | 12. Lancuan |
| 5. To Dongying | 13. Jiaoxian |
| 6. Taishan | 14. Laoshan |
| 7. Jinan | 15. Qingdao |
| 8. Zhangdian | |

Rebirth After Liberation

After Liberation, this railway had only obsolete equipment, light and miscellaneous rails and rotten ties. It was full of scars and fit only for small locomotives running at the rate of 30-40 km per hour. Along with the recovery and development of the national economy, the state each year allocated huge funds for the improvement of this railway. In addition to its constant technical renovation and transformation, the state also on two occasions--1963-1964 and 1980-1981--replaced the rails of the entire line, strengthened or rebuilt the substandard bridges, corrected the major defects, extended the branch tracks, updated the signaling equipment and improved the system of dispatching. The appearance of the railway underwent a complete change. The light and miscellaneous rails of 30-40 kg of the old Jiao-Ji Railway have been completely replaced with new 50-kg rails produced in our own country. Now, large locomotives are free to run on this line at a speed of more than 100 km per hour.

National economic development has now brought the traffic capacity of the single-track Jiao-Ji Railway to the saturation point. Because of the continued increase in both passenger and freight traffic and particularly because of the sharp increase in the volume of coal transported out of Shanxi and in foreign trade, the strain on this railway has been even more keenly felt. It has become a weak link in the national network of railways. In the bottleneck east of Zhangdian, only 27 pairs of freight trains can pass in 24 hours with a maximum traffic volume of 15-18 million tons. In 1980, the Jinan Bureau set a new record of an average of more than 19 million tons through this section, the highest on the entire single-track railway. Nevertheless, this traffic volume is still far short of the objective requirements. The 3d Plenary Session of the 11th Party Central Committee, like a strong easterly wind, quickened the pace of the four modernizations, while the people's higher living standards and the developing tourism further intensified the contradiction between the railway's transport capacity and its traffic volume. That is why the double tracking of the Jiao-Ji Railway was listed as one of the key projects in the Sixth 5-year Plan, and the Ministry of Railways also listed it as a key project in the transformation of railway operations throughout the country.

General Picture of Double Tracking

The total length of the railway's double track is some 380 km, while 68 of its stations are newly built or transformed. The volume of engineering work was huge and the technology was complex. According to a preliminary estimate, the project called for approximately 12 million cubic meters of earth- and stoneworks, more than 400 bridges and culverts of various sizes, approximately 800 km of rails for regular station lines, more than 1,250 sets of switches, 450,000 square meters of various types of housing space, more than 500 km of high- and low-voltage wires, 420 km of communications cables with small copper cores and the centralization of electric power in all stations in addition to a gradual introduction of the automatic blocking system for the entire railway. The total investment is estimated to be approximately 800 million yuan.

The double-tracking project is under the unified leadership of the Double-tracking Engineering Command of the Jiao-Ji Railway, Shandong. For a concentration of resources and reduction of the construction period, the central authorities called for unified design and separate construction by different sections. The Ministry of Railways decided that the Second Design College would be put in charge of the entire line's design, while the Third Engineering Bureau and the Jinan Subbureau shared the task of construction. Construction was to be carried out separately in different sections which will be able to increase their own transport capacity in different periods. Aside from the 10.7-km section between Licheng and Huangtai, which was completely double-tracked and open to traffic in 1961, seven stations including those in Hutian, Jinlingzhen and Dongfeng were transformed or expanded one after another in 1979. In March 1980, when the Double-tracking Engineering Company of the Jiao-Ji Railway, Shandong, had been established, the first stage of engineering (double-tracking the section of more than 330 km which included 45 stations and 53 zones) began on an all-out basis and the work proceeded with increasing momentum. According to statistics, 37 zones with 29 stations were opened for traffic by the end of 1983 and it is anticipated that by the end of June of this year, 15 other zones will be opened and 16 other stations completed. On "1 July" of this year, the entire line between Jinan and west of Lancuan station will have double tracks.

The completion and commissioning of the double tracks in the first stage of work will increase the traffic capacity of the zones by 50 percent and will help alleviate the strain on the means of transportation. Then, after the completion of the double-tracking and the auxiliary projects, the utilization rate of the railway's freight traffic capacity will be raised to 90-100 percent, and the annual traffic volume may reach 58-60 million tons, more than trebling the present volume. This will be of great significance to the development of the national economy and the acceleration of the four modernizations.



Double-track Railway from Zhoucuan to Wangcuan
Open to Traffic

Abundance of Products

Mineral products are abundant along the railway track. Eastern Shandong produces large quantities of Yantai apples, Laiyang pears, fish, shrimp and other maritime products. Besides, there is a concentration of the best industrial technical talents in Shandong Province. The industrial output value along this railway accounts for more than 70 percent of Shandong's total industrial output value. Apart from textiles, printing and dyeing, papermaking, motor vehicle manufacturing and machine building in Jinan and Qingdao, other industrial technologies such as those of petrochemicals, electronics and power machinery have undergone great development and have gained national fame in Zibo and Weifang Municipalities in recent years. Here, we also have the second largest oilfield in the country--the Shengli Oilfield--and large oil refineries, chemical fiber plants, rubber plants, large chemical fertilizer plants, large power-generating plants and the national key project--the Qilu ethylene project--still under construction. They are like bright stars scattered all over the sky and shedding their brilliant light. The handicraft products produced along the railway are also well known. Among the artistic objects are carved shells and woven straws produced in Qingdao, the silk of Zhoucuan and the porcelain of Boshan, all well known at home and abroad. These colorful handicraft products, after being updated, will become even more fascinating to Chinese and foreigners.



Marshaling Yard of Lancuan West Station

Exquisite Scenery

The scenery along the railway track with many historical sites is so exquisite that many visitors have seemed reluctant to leave. In Jinan, the city of ancient springs, there are 72 springs including the Baotu [Leaping] Spring and the Heihu [Black Tiger] Spring of world renown. Some 20 km south of Zhangdian Station is Pujiashuang in Zuchuan District of Zibo Municipality, the native village of Pu Songling, author of the famous "Strange Tales of the Lonely Parlor." There is a display room in the author's home containing various extant copies of his works. On both sides of the main entrance to this house are the lines of a couplet handwritten by Guo Moruo, which read: "In depicting ghosts and demons, he is second to none" and "his satire against greed and cruelty pierces the bone to a depth of 3 fen."

Beautiful Qingdao is a summer resort of world fame. There is the "Xiaoqin Island" with luxuriant trees, the "Qianhai Bridge" built in 1891, the Lu Xun Park which is full of charm and tranquility and a museum of maritime products of a unique architectural design. The most attractive scenery is perhaps found in the "Eight Large Passes" east of the city. They are so called because they are separated from one another by eight criss-crossing roads. Their names are "Shanghai Pass," "Jiayu Pass," "Zhengyang Pass," "Wusheng Pass," "Ziqing Pass," "Ningwu Pass," "Jurong Pass" and "Shaoguan Pass." In these passes are rare specimens of flowers and trees resembling gorgeous clouds. Among the woody growths are houses of various designs in neat rows. Their red tiles which blended with the green leaves further enhance the beauty of the landscape. Laoshan in the suburbs of Qingdao is another tourist spot that has recently opened. Here we can see undulating mountain ranges, waterfalls and large varieties of flowers and trees. The mineral water produced here is pure and tasty. It is well received at home and abroad and sells well on foreign markets.

The Jiao-Ji Railway, after the completion of its double tracking, will make even greater contributions to the acceleration of the four modernizations and the development of tourism.

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TRANSPORTATION

THIRTY-FIVE YEARS OF HIGHWAY DEVELOPMENTS REVIEWED

Beijing GONGLU [HIGHWAYS] in Chinese No 9, 25 Sep 84 pp 2-5

[Article by Wang Zhanyu [3769 1455 1942]: "Highways Criss-crossing the Divine Land--Celebrating the 35th Anniversary of the Founding of the People's Republic"]

[Text] It has now been 35 years since the founding of the People's Republic. Phenomenal changes have occurred in these 35 years and the highways have taken on a completely new appearance. If we look at the newly published map of national highways, we can see the criss-crossing highways closely connecting the motherland's capital with the frontier regions, the cities and the countryside. According to 1983 statistics, there are now more than 915,000 km of highways throughout the country, and more than 180,000 km of them are surfaced with asphalt. Compared with 1949, the total mileage of highways has increased 10.5-fold, and that of high- and medium-grade surfaced highways increased nearly 600-fold. These are great achievements.

Highways were very backward in Old China. Although construction of the highway from Youyiguan [Friendship Pass] in Guangxi to Longzhou began as early as in 1906, only 80,658 km of highways in the country were open to traffic at the end of 1940. The highways were not only few, they were also of low standard and inferior quality and were irrationally distributed. At that time, the highways were mostly concentrated in the eastern coastal areas and were almost nonexistent in the mountainous areas, frontier areas and the minority nationality areas even though these areas constitute two-thirds of the national territory. Qinghai Province, with an area of more than 720,000 square km, had only 472 km of highways, while the Guangxi Zhuang Autonomous Region had only 213 km despite the congested traffic. Since the founding of New China, a large-scale highway construction program began in the country. The surveyors, designers and builders of highways, with the cooperation of the PLA and civilian laborers and in defiance of inclement weather and various kinds of hardships, have constructed many difficult highways in the frontier and mountainous regions. According to the statistics of 10 provinces and autonomous regions, namely, Guangxi, Hunan, Fujian, Yunnan, Sichuan, Guizhou, Xizang, Qinghai, Xinjiang and Nei Mongol, more than 350,000 km of highways have been built since the founding of the People's Republic. Many border regions and hamlets along steep cliffs rarely visited by people in the past are now accessible by

vehicle. In Yunnan, where people had to "scale 1,000 mountains after crossing 1,000 rivers," mountainous areas account for 90 percent of the provincial territory. There is Gaoligongshan in the west, Wuliangshan and Zhonglaoshan in the south, Yulongxueshan in the north and Wumengshan in the east. Roaring rivers like the Lancang Jiang, the Jinsha Jiang, the Nu Jiang, the Yuan Jiang and the Nanpan Jiang run across the province from north to south. The mountains are high, the gullies deep and the terrain hazardous. Transportation is therefore extremely difficult. Since Liberation, the people under the leadership of the people's government have built more than 40,000 km of highways and many large bridges over the rivers. As a result, 90 percent of all townships and communes are now accessible by vehicle. The Xizang Autonomous Region, located on the "roof of the world," has an area of 1.2 million square km. There was not a single highway in the past, and the Tibetans, all the time surrounded by rolling mountains and turbulent rivers, were cut off from the rest of the world. After the peaceful liberation of Xizang, the brave PLA and the broad masses of road builders, with the heroic spirit of "subduing the mountains and rivers," undertook a gigantic road-building project on the Qing-Zang Plateau where the weather is cold, the geology complex and the air density low. With their hard-working hands, they cut through high mountains rarely visited by human beings, harnessed the roaring rivers, stopped the flowing sands and made their way through the sky-darkening virgin forests. At the end of 1954, the Chuan-Zang highway and the Qing-Zang highway were simultaneously completed up to Lhasa, followed by the building of nearly 100 trunk and branch highways. Now, the highway mileage in this region is over 22,000 km and an all-embracing highway network with Lhasa as the hub has begun to take shape. This network has played a very important role in promoting industrial and agricultural production, strengthening frontier defense, cementing national unity and accelerating the socialist revolution and socialist construction in Xizang.

Highway bridge construction has also proceeded at a high speed along with the increased number of highways. There are now more than 130,000 highway bridges in the country with a total length of approximately 4 million meters. These bridges, if all joined together, would stretch from the northern border of the motherland all the way to the coast of the Nan Hai. More than 90 percent of them are permanent bridges of various types. Some are stone arch bridges, and others are hyperbolic arch bridges. There are also reenforced-concrete arch bridges, girder bridges, cable-stayed bridges, steel truss bridges, steel arch bridges and suspension bridges. Most of them were built after Liberation and some of their designs and construction techniques reached advanced international levels. The Huang He, more than 5,400 km long, had only one highway bridge at Lanzhou before Liberation, and the construction of even this bridge was contracted to a foreign construction company. After Liberation, nearly 40 highway bridges were completed throughout its course from Qinghai in the west to the northern plain of Shandong in the east. Among them are the Luoyang Huang He bridge, 3,492 meters long; the Jinan Huang He bridge with a 220-meter span at the main arch; and the Beizhen Huang He bridge with piles 107 meters deep. The sizes, designs and quality of construction of these

bridges all occupy an important place in the history of bridge construction. The stone arch bridges of our country have a long history and we have accumulated rich experiences in their construction. The Anji bridge of Zhaozhou, Hebei, built as early as 1,300 years ago, has a span of more than 37 meters. The 265-meter Lugou bridge over the Yongding He, built more than 700 years ago, has been all along an object of admiration by bridge builders at home and abroad. Stone arch bridges have undergone great development since the founding of New China. The Longmen bridge of Luoyang with a 90-meter span, the Changhong bridge of Yunnan with a 112-meter span, the Jiuxigou bridge of Sichuan with a 116-meter span and the 358-meter Baisha bridge of Zhejiang were built later one after another. The construction techniques of the stone arch bridges in our country have risen to a new level.

Highway maintenance has also been continually strengthened since the founding of New China. These are now more than 2,700 maintenance sections and more than 48,000 road maintenance squads with nearly 1 million maintenance workers and civilian laborers constantly working in the fields to keep the highways wide open. Based on the realities in our country, these workers have constantly explored the laws of road maintenance, improved their maintenance techniques, and, after many years of experiment, discovered many simplified methods which have greatly improved highway conditions. They also displayed the spirit of the "Foolish Old Man moving the mountain" and unfolded the "five ones" activities among the maintenance squads, meaning that after completing their regular duties, they should each year use the manpower and material resources of the squads to remove one source of hazards, to widen one section of roadbed, to reduce one slope, to smooth out one curve and to repair one culvert. Thus year after year, without using the state's capital construction investment, they have section by section transformed the crudely built highways full of sharp curves and pits into fairly smooth and straight highways. In some areas without sand or gravel, these workers devised various methods to look for locally available materials. They dug sandy gravel from under the ground and mobilized the masses to collect brick fragments. With mortar as the bottom layer and sandy gravel and brick fragments as the upper layer of road surface, they transformed some highways, impassable on rainy days, into all-weather highways. Most of the asphalt and residual oil surfaces in the country were laid by the highway maintenance departments using the road-maintenance fees and mobilizing the maintenance workers and the civilian laborers. To reduce the amount and the intensity of labor in highway maintenance, to raise work efficiency and to ensure the high quality of maintenance, the highway departments have since the late 1960's mobilized the broad masses to carry out technical renovations in a big way, to upgrade or trail-produce various types of road maintenance tools and to produce more economic and practical road maintenance machinery. This was how they produced rollers and integrated road maintenance trucks and pick-ups. With tractors as the source of motive power, they also remodeled the road-maintenance sets for spreading sand, recovering sand, spraying water, sweeping snow and scraping out bumps on the surface. While keeping the highways in good condition, the workers throughout the country also responded to Comrade Mao Zedong's call for

"covering the motherland with trees." In cooperation with the people along the roads, they planted trees and lined the highways with them. Now, the highways in our country are lined by more than 200 million trees, and 300,000 km of the highways are up to the "green" standard, which adds a great deal to the beauty of the land.

In the past 35 years, education and scientific research have undergone great developments in serving highway construction. Before Liberation, there were no vocational highway schools in the country; only in some universities and special secondary technical schools were there special courses of civil engineering and road and bridge construction. The number of graduates in these courses was very small each year. After Liberation, we newly established the Xian Highway College, the Chongqing Communications College, the Changsha Communications College and 28 other communications schools. Special courses on roads and bridges were also included in the curricula of eight other vocational colleges. More than 2,600 students were enrolled each year for vocational highway and bridge courses alone. Many localities have established large number of technical schools so that the technical force of the highway departments could be continually strengthened and the competence of their personnel continually enhanced. Highway science and technology have also undergone great development. We have accumulated rich experiences in rock blasting, in preventing disasters from mud rock flows, sand storms and blizzards, in building, surfacing and maintaining macadam roads, in treating and protecting frozen ground on the plateau and in designing and building bridges. The hyperbolic arch bridge--with foundations of concrete piles bored into the bedrock--which we invented and built, has the advantages of simplicity of construction equipment, convenience in construction, high efficiency and savings in steel bars and timber. Bridges of this type were built all over the country back in the 1960's with good results. Most of the scientific achievements in foreign countries in bridge construction have also been adopted in our country. In the past several years, some of our highway scientific research and design units have acquired electronic computers and survey equipment and have used them to good advantage in bridge designs, material storage and highway surveys.

After the founding of New China, highway workers have been dispatched by the state to 18 countries in Asia and Africa on economic aid missions and to promote friendship among different peoples. These workers have built 46 highways totaling 6,016 km in length and 17 independent bridges totaling 3,478 meters in length. In the past several years, the China Road and Bridge Engineering Company has contracted for the construction of 5 highways, 2 independent bridges and more than 100 small and medium-size projects in 5 foreign countries. Since the workers we sent abroad were all well disciplined and hard working with a high respect for agreements and a keen sense of responsibility, all work was completed according to schedule and fine quality was assured. These workers have won favorable comments and admiration from these countries and their peoples and have helped promote friendship among the peoples of various countries.

Highway construction in our country has passed through several stages of development and many good experiences have been accumulated in the past 35 years.

In the period from the founding of New China to 1958, the state always considered highway construction one of the priority projects in communications construction. State investment was used on the important trunk highways and professional contingents were put in charge of their design and construction. The construction of ordinary trunk highways were financed and organized by the provinces, municipalities and autonomous regions, while in the construction of county and township highways, we had to rely on the policy of using the local civilian work force with or without state subsidies and on a series of policies of "walking on two legs." In 9 years, we built more than 300,000 km of new highways and completed the Chuan-Zang highway, the Qing-Zang highway, the Shen-Dan highway, the Kun-Luo highway, the Hai-Yu highway and the Fu-Wen highway in addition to many other difficult projects. Since the initiative coming from both the central and the local authorities was brought into play fairly effectively, we were able to make speedy progress, achieve fine quality and develop both the trunk and the branch roads in a well-coordinated way. At the same time, we trained a contingent of nearly 100,000 persons specializing in surveying, designing and building highways and set up highway engineering standards and highway administration regulations. Many of the experiences gained at that time are still of practical significance today.

In 1958, the policy of "relying on the localities and the masses and stressing popularization" was adopted in highway construction as a means of accelerating highway development in the counties and townships, and we set a proud record of building more than 80,000 km of highways in only 2 years, 1959 and 1960. These highways, though of a low standard, have served their purposes and are being preserved after certain repairs and improvements. However, because of "leftist" thinking, the problem of stressing quantity and neglecting quality and other problems, especially the criticism of nonexistent "high standards," appeared. The contingents of highway surveyors, designers and builders, originally directly under the central government, were downgraded, and the necessity of unified planning and state investment in trunk highway was ignored. The development of trunk highways was thus hindered.

In 1962, guided by the central authorities' policy of "readjustment, consolidation, replenishment and improvement," the CPC Central Committee and the State Council issued the directive "Concerning the Strengthening of Highway Maintenance and Administration" and laid down the policy of "strengthened maintenance, active recovery and gradual improvement." Later, the State Council again approved the "Report and Request for Instructions Concerning the Question of Adding an Asphalt Layer for Wear and Tear on Highways" and the "Report and Request for Instructions Concerning the Alteration of Wooden Bridges on Highways and Rural Roads" submitted by the Ministry of Communications. The Highway Design College and the Highway Engineering Bureau of the Ministry of Communications were

reactivated, while the highway construction contingents in various provinces, municipalities and autonomous regions were further strengthened. Highway construction thus entered a new stage of consolidation, improvement and steady development. After more than 10 years of effort, the quality of the road surfaces has been greatly improved, most of the wooden bridges and dangerous bridges were changed to those of a sturdy and permanent type, the trunk highway ferries were completely mechanized and some of the important ferries were replaced by bridges. Fuzhou's Wulongjiang bridge with a 144-meter span at the main arch, Changsha's Xiangjiang bridge with a total length of 1,250 meters, Jian's Ganjiang bridge in Jiangxi and Qianfu's Songhuajiang bridge in Jilin were all constructed in the 1960's and the early 1970's. Because of the disruptions by Lin Biao and the "gang of four" during the 10 years of turmoil, the party, the state and the people all suffered serious setbacks and losses, and highway construction was also affected. However, thanks to the people's eagerness to change the backwardness of communications and their enthusiasm in building roads and bridges, highway construction continued to develop and by the end of 1976, the total highway mileage in the country was increased to more than 820,000 km.

After the 3d Plenary Session of the 11th Party Central Committee, the Party Central Committee decided to shift the focus of work to economic construction and to concentrate resources on the development of energy and transportation. Later, the State Council issued the "Notice Concerning the Repair of the Damaged Sections of the National and Provincial Trunk Roads" and affirmed the successful experiences of using the labor of local civilians with or without state subsidies in maintaining and repairing highways. The leading comrades of the central authorities have also made many important speeches on the question of highway construction. They pointed out the need to overcome the mistaken idea of neglecting highways and broad highways and to repair and widen more highways so that they could become "more even with less of a gradient and a little straighter." The highways should be wide enough for three or four vehicles to run abreast, and this would be an important measure to boost the economy. They wanted us to view things from the strategic or the macroscopic viewpoint and not be afraid of encroaching on farmland. In accordance with the instructions of the leading comrades of the central authorities and in view of the new situation and new developments, the communications departments, after summing up their experiences, laid down the policy of "overall planning, strengthened maintenance, positive improvement, scientific administration and assurance of free traffic flow." On the one hand, they relied on the localities and the masses in repairing and building county and township highways so as to solve the problem of people having difficulty in travel. On the other hand, they worked out plans for a national network of trunk highways and systematically organized the provinces, municipalities and autonomous regions to step up their work in improving their busy trunk highways, in repairing the damaged sections and in raising the standards, quality and traffic capacity of highways. Thus, guided by the principle of combining popularization with the raising of standards and with the greater stress on the latter, highway construction underwent an all-round development under a unified plan. In the 7 years from 1977 to 1983, we built more than 90,000 km of highways

and nearly 20,000 permanent bridges with a total length of 1 million meters. The grade-1 highways between Beijing and Miyun, between Shenyang and Fushun and between Nanjing and Liuhe and the grade-2 highways between Guangzhou and Shenzhen, between Fuzhou and Xiamen, between Nanchang and Jian and between Huhhot and Baotou were all completed in this period. By the end of 1983, there were 255 km of grade-1 highways, 17,167 km of grade-2 highways and 119,203 km of grade-3 highways in the country. At the same time, the Qing-Zang highway and the trunk highways from Beijing to Shenyang, from Beijing to Zhengzhou and from Lanzhou to Xining were altered according to grade-2 standards; while the construction of grade-1 highways from Liuhe to Yangzhou and from Shenyang to Anshan as well as 10 independent bridges, including those over the Huang He at Zhengzhou, over the Songhua Jiang at Harbin, over the Ou Jiang at Wenzhou, over the Wan Shui at Changde, Hunan and over the Han Jiang at Shayang, Hubei, were proceeding in earnest. The work of surveying and designing the expressways from Beijing to Tianjin and Tanggu and from Guangzhou to Shenzhen is also in progress. After the completion of these projects, the technical conditions of our highways will show a marked improvement.

In the past 35 years, highway construction has developed fairly rapidly. However, because of our vast territory and the poor foundation left from the past, the number and quality of our existing highways are still inadequate for the development of industrial and agricultural production. Even now, more than 40,000 townships in the country are inaccessible by vehicle. Many trunk highways are of low standard, and the congestion of vehicles makes traffic even more difficult. The problem of transportation and the people's difficulty in traveling have still not been solved. Highway transport is still a weak link in the national economy, and the task confronting us is formidable. We must strengthen our morale, work hard, have the will to reform, advance with a pioneering spirit, break away from the old conventions that restrict highway development, give full play to the initiative from two different quarters, strengthen the work of education and scientific research, increase the competence of workers, adopt new techniques, new technologies and new materials, continue to raise the technical and administrative levels of the highways, lower the engineering costs, ensure good engineering quality and try every possible way to speed up highway construction in our struggle to modernize our highway construction.

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TRANSPORTATION

ACHIEVEMENTS IN HIGHWAY CONSTRUCTION DESCRIBED

Beijing GONGLU [HIGHWAYS] in Chinese No 9, 25 Sep 84 pp 6-8

[Article by Xian Lizhi [0341 4539 1807]: "Brilliant Achievements in Highway Construction"]

[Text] Highway construction has undergone great development since the founding of New China. At present, 915,000 km of highways are open to traffic, more than 130,000 bridges have been built and the technical level of surveying, designing and construction has continued to rise. All the 29 provinces, municipalities and autonomous regions in the country have their own surveying, designing and construction contingents, and surveying is developing from the conventional method to that of aerial surveys with fairly advanced survey instruments, such as infrared distance meters, precision restitution coordinatography, precision three-dimensional mapping instruments, surface photo theodolites, rectangular coordinatographs and so forth. The technology of the electronic computer is being gradually popularized in design.

In the early 1950's, we built the Sichuan-Xizang and the Qinghai-Xizang highways on the "roof of the world." These highways were hailed all over the world as miraculous achievements. We were at that time mostly building macadam roads, but now we are building middle- and high-grade asphalt roads, and there are approximately 180,000 km of them in the country. On the "roof of the world," we have transformed the Qinghai-Xizang highway of 1,940 km according to the standards of grade-2 highways and have resurfaced it with asphalt. Foreign countries have had experience in surfacing highways with asphalt only on high-altitude frozen ground but not on frozen plateau ground. Therefore, the surfacing of the Qing-Zang highway on frozen plateau ground was an unprecedented achievement. There are complex changes in the frozen ground on a plateau, since they are closely related to the changes in the conditions of geology, sunshine and ground temperature as well as the high elevation. That is why different techniques have to be used as required by these changes in order to ensure good engineering quality. Our technicians have worked hard day and night on the oxygen-deficient plateau, and by now, the technical problems, both theoretical and practical, of building asphalt road on the frozen ground of the plateaus can be solved. The creativeness of this contribution cannot be denied.

There has been a gradual development in mechanization along with that of highway construction, but this development is uneven. The level of mechanization in bridge building is higher; in some bridge construction sites, the work is 80 percent mechanized, with the use of combined bridge-laying machines, semiautomatic weight-lifting and installation equipment and electronic-controlled cement production lines being introduced. However, earth- and stonework is not as good as bridge building, the roadbed is not as good as the road surface and the branch highways are not as good as the trunk highways. The level of mechanization is closely related to the industrialization of the country as a whole. Along with the progress of the four modernizations, therefore, the mechanization of highway construction will certainly develop fairly rapidly.

The trial manufacture and application of new materials are also developing in highway construction. For example, the trial production of emulsified asphalt, the use of industrial waste and the experiment on and use of reenforced concrete have also shown gratifying results.

Developments in the technology of highway bridge construction are also remarkable. In the early post-liberation period, many stone arch bridges were built in various locations with locally available materials. The typical examples are the Yanhe bridge with three arches and a 30-meter span in Yanan; the Huanghukang bridge with a single arch and a 60-meter span in Hunan; the Yugong [Foolish Old Man] bridge with a single arch and a 102-meter span in Huixian and the Huwan bridge with a single arch and a 105-meter span in Xinxian, Henan; the Changhong bridge with a single arch and a 112-meter span in Yunnan; the Jiuxigou bridge with a 116-meter span in Sichuan; and so forth. Our bridge builders have developed the new hyperbolic arch bridge with distinctive national characteristics unmatched in foreign countries. This type of bridge is built without supporting frames, or with only simple supporting frames. Its typical examples are the Luding bridge with a 110-meter span in Sichuan; the Xiangjiang bridge with a 76-meter main span and a total length of 1,250 meters in Changsha, Hunan; the Wujiang bridge with a 86-meter main span and a total length of 220 meters in Guizhou; the Foziling bridge with a 112-meter span in Anhui; the Pingmei bridge with a 110-meter span in Luochang, Guangdong; the Shanglongtan bridge with a 108-meter span in Suichang, Zhejiang; the Shiquan bridge with a 100-meter span in Hanjiang, Shaanxi; and the Qianhe bridge with a 150-meter span--so far the longest span for our arch bridges--in Songxian, Henan. With improved machinery and equipment, we have also built many reenforced concrete truss arch bridges on our highways, in addition to 180-span steel box arch bridges and steel truss arch bridges, the longest of our steel arch bridges on the highways.

Following the development of our steel industry and the increase in the variety of steel materials and in their tensile strength, prestressed concrete bridges have appeared on our highways. The first prestressed concrete bridge with a 20-meter span was built on the highway between Beijing and Zhoukoudian in 1957. Since then, bridges of this type have appeared in increasing numbers on our highways. A fairly long one is the Linhai bridge with nine 30-meter spans, ten 17.5-meter spans and a total

length of 550 meters in Zhejiang. In 1961, we built a single arch bridge with a 60-meter span, using prestressed concrete binding joists, over the Qili He in Lanzhou. From this bridge, we have gained some experience in designing and building prestressed concrete bridges. In 1965, we built the first lot of prestressed concrete T-shape rigid frame bridges, including the Wulinghe bridge in Henan and the Yanhe bridge in Jiangsu, both with a 50-meter span. Since then, prestressed concrete T-shape rigid frame bridges have been in popular use, and their spans have become longer. In 1968, we completed the construction of the Liu Jiang bridge with a main span of 124 meters and a total length of 608 meters in Liuzhou. In 1970, we built the Jinggangshan bridge with a span of 71 meters and a total length of 1,090 meters in Jian. In 1971, we built the Wu Jiang bridge with a span of 144 meters and a total length of 548 in Fujian. In 1981, the Chang Jiang bridge with the widest span of 174 meters was built and opened to traffic in Chongqing. This is so far the widest span for prestressed concrete T-shape rigid frame bridges in our country. In 1975, the first cable-stayed bridge was built, followed by the Huang He bridge in Jinan in 1982. It has a main span of 220 meters, the widest for cable-stayed prestressed concrete bridges in our country. In 1979, the first continuous prestressed concrete highway bridge was completed with the jack-and-push method in Dongguan County, Guangdong. In recent years, this method of highway bridge construction has been in popular use. For example, the Huang He bridge in Baotou, Nei Mongol Autonomous Region, and the Zhongtang bridge in Guangdong were built with this method.

The Huang He and the Chang Jiang are the two world-famous rivers of our country. Before Liberation, there was only one steel bridge over the Huang He in Lanzhou, and this bridge could accommodate only one vehicle at a time. Now there are nearly 40 bridges of various types over this river, and 4 others are still under construction, including the one at Zhengzhou, more than 5,100 meters long, and so far the longest highway bridge in our country. The Chang Jiang did not have a single bridge before Liberation. Now there are nearly 20 highway bridges of various types, including the San Jiang highway bridge at Gezhouba, which can be used by vehicles with a load of 54 tons. This is the highway bridge having the largest load-bearing capacity in our country.

As for the construction of the bridge foundation, the method of bulk excavation was mostly used in the early post-liberation period. Other methods used were manual excavation, sinking caissons and driving piles. In building the foundation of the Xiangtan bridge in Hunan in 1959, floating caissons were made of wood for drawing sands in addition to the use of percussion drills of the rocket type. The volume of underwater work was greatly reduced, and the result of construction was much improved. In the early 1960's, the method of sinking concrete piles into the bedrock through bored holes proved to be successful in Henan, thus promoting the development of construction techniques for bridge foundations. In the late 1970's, the foundation of the Guanghua bridge in Hubei was built with the use of precast reinforced-concrete floating caissons in combination with the sinking of piles through bored holes. The amount of underwater work was further reduced. From this, we can

see the gradual improvement and development of technology in building bridge foundations from the practice of highway bridge construction.

Before Liberation, there were very few highway tunnels in China. Since the founding of New China, the development of highway construction, and particularly the construction of the large number of mountainous highways, have spurred on the work of highway tunnel construction. Many tunnels have been cut in the mountainous areas in, for example, Sichuan, Yunnan, Guangxi and the suburbs of Beijing. In Henan, more than 30 highway tunnels have been built since 1958, and the longest one was more than 1,700 meters. We have summed up many valuable practical experiences which should play a positive role in improving the construction of highway tunnels. In the past 35 years, we have opened more than 380 tunnels with a total length of some 50,000 meters. The No 2 tunnel in Tianshan, more than 1,800 meters long, is so far the longest highway tunnel in our country.

In the 35 years since the founding of the People's Republic, we have in practice accumulated many good experiences in ensuring the good quality of highways and have set up a series of effective rules and regulations. According to these rules and regulations, for example, the procedures for capital construction must be adhered to, the advance work must be carefully carried out and the design of a highway has to be divided into sections to be examined and approved at each level. Construction projects should be organized and designed, and construction plans should be examined and approved. The construction materials should be inspected and tested, and the technical information should be systematically disseminated. Construction should proceed according to the design and the proper procedures, and the primary records should be carefully kept. There should also be systems of job responsibility, of handing over and taking over duties at each shift, of supervision and control, of quality examination and of rewards for good quality, etc. All these are the traditional systems of quality control in our highway construction. In April 1982, the Ministry of Communications held a meeting at the work site of the Luzhou bridge, Sichuan, for the exchange of experiences in highway engineering quality control, for the promotion of total quality control and for the combination of our traditional system of quality control with the new methods of total quality control so as to form an effective quality control system that is suitable for highway construction. We have achieved certain success in this respect in recent years.

The standards, or established norms, of highway construction are important basic factors reflecting the technical level of highway construction in our country. We have continually summed up our experiences in highway construction, conducted scientific research, raised our experiences on to the plane of theories with the backing of law and then used these theories to guide highway construction in practice. These experiences have become established technical norms. This work started from scratch after the founding of New China. The comrades in the highway departments have done a great deal of work, collected a huge quantity of data and summed up various experiences while gradually compiling the "Technical

Standards of Highway Engineering" and other norms concerning prospecting, designing, engineering, engineering materials and safety factors. The work on 20 subjects has been published or is being published, while that on 39 other subjects is being compiled. The publications embodying state standards are: "Norms of Road Design for Factories and Mines," "Norms of Asphalt-cement Highway Construction," "Norms of Cement Highway Construction" and "Standard Highway Grades and Signs." From this, we can see how the highway comrades have worked in the past 35 years in laying the foundation of highway technical norms. Compared with the well-developed countries, however, our work in this respect is still fairly weak.

Along with the smooth progress of national economic readjustment, the introduction of the system of responsibility for agricultural production, and particularly the development of various types of specialized households and commune- and production brigade-run industries after the 3rd Plenary Session of the 11th Party Central Committee, there have been increased outputs of agricultural, animal husbandry, fishery and sideline products, and the peasants eagerly expect their products to be transported to the city markets and want industrial products to be transported to the countryside in return. Furthermore, after the improvement of their operation and management, the enterprises of various trades are now attaching importance to the quick turnover of funds and better economic results. They are making greater use of highways for transportation so that they can transport their high-grade industrial products and their fresh and easily perishable goods, such as Yantai apples, Laiyang pears, Dezhou melons, etc., to Beijing quickly and with much less damage en route. On the other hand, people with higher standards of living would like to travel. In 1983, the passenger turnover on highway transport increased by 14.7 percent, as opposed to 12.8 percent in railway transport. All these facts show the promising future of highway development in accordance with an objective law which is independent of human will. Therefore, our highway workers should seize this favorable moment to exploit this new situation and redouble their efforts to promote highway technology so as to catch up with the advanced world levels in the not-too-distant future.

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TRANSPORTATION

HIGHWAY MAINTENANCE, ADMINISTRATION IN PAST 35 YEARS REVIEWED

Beijing GONGLU [HIGHWAYS] in Chinese No 9, 25 Sep 84 pp 19-22

[Article by Hu Fujiu [5170 4395 0006]: "Highway Maintenance and Administration in Past 35 Years Reviewed"]

[Text] Highways in our country were extremely backward in the initial period of the People's Republic. Although Old China's highways had a history of 50 years, their total mileage was only some 120,000 km. Because of the lack of maintenance and particularly the damage caused by natural disasters and the ravages of war, only slightly more than 80,000 km could barely be used by vehicles at the end of 1949. Most of the highways in the north were unsurfaced natural dirt roads, which became unusable on rainy days. In the south were mostly macadam roads which became muddy and full of pits and ruts on rainy days. Most of the bridges and culverts were built of wood with a low load-bearing capacity and a short service life. Many highways were short of bridges and culverts and vehicles had to wade across the streams or be ferried manually across the rivers. Maintenance and administration were even more backward. Apart from the trunk highways south of the Chang Jiang, and in part of the northwest where regular maintenance squads were available, only civilian laborers could be mobilized in certain seasons for maintenance in the northern regions, and practically no road maintenance organs existed in the northeast. At that time, there were only some 20,000 highway maintenance workers throughout the country, and most of them were illiterate. All the work was done manually, and technicians were very scarce. It was extremely difficult for the highways to maintain their normal operations, not to speak of making progress.

In the 35 years after the founding of the People's Republic and under the leadership of the party and government organs at all levels, great achievements have been made in the work of highway maintenance.

First, along with the increase in the number of highways and vehicles, the maintenance force has gradually expanded, the mileage of highways with regular maintenance has increased and the highways are being kept in fairly good condition. By the end of 1983, 915,000 km of highways were open to traffic in the country, an 11-fold increase, and the number of civilian vehicles was increased more than 40-fold. The average

number of vehicles on the roads each day reached 300 [as published] including a daily average of 900 on state highways, and 40,000 km of highway were used by more than 1,000 vehicles. At present, the highway administration organs are basically functioning well. Each province has a highway administration bureau, with branch bureaus at the municipal and prefectural levels. Below them are more than 2,700 road maintenance sections and nearly 50,000 maintenance squads. More than 80 percent of the total length of highways are under regular maintenance. Regular highway maintenance personnel number more than 780,000, including more than 490,000 professional workers, or 16 times the number in the initial period of the People's Republic. The quality of the work force has also greatly improved. Very few of these workers are illiterate, and the cultural level of a considerable percentage of them is above that of junior secondary school. There are more than 20,000 technical cadres, more than 20,000 vehicles of various types, nearly 30,000 tractors and approximately 40,000 roadrollers, bulldozers, stonecrushers, spreaders and maintenance machines of various types. The highway authorities also set up many machine-repair factories, asphalt-processing factories, bridge component plants and factories producing cement and other materials. In the country, there is now a highway maintenance contingent that has passed the required tests and is in possession of the required technical equipment. Since the 3d Plenary Session of the 11th Party Central Committee, the broad masses of workers have struggled hard to prevent damage caused by rain, snow and vehicles, and the proportion of good highways resulting from good maintenance has continued to increase every year. At present, the average proportion of good roads in the country is above 60 percent; that of the trunk lines, more than two-thirds; and that of one-third of the 29 provinces, autonomous regions and municipalities directly under the central government, 75 percent. The proportion of poorly maintained highways has been reduced every year. It is below 8 percent in most provinces, and even down to 4.5 percent of the trunk highways.

Second, out of the collected road maintenance fees, the highway administration departments in various localities have appropriated funds to organize a civilian work force for highway construction and have carried out technical transformation on the existing highways each year in order to increase their traffic capacity and to strengthen their resistance against natural disaster. Despite the scarcity of state investment, highways have undergone great changes. In the past 35 years, the length of surfaced highways has increased from 30,000 to 700,000 km, and the proportion of surfaced trunk highways has increased from approximately 40 percent to 95 percent. Formerly, high-grade or medium-grade surfaced roads were virtually nonexistent; now there are more than 180,000 km of them, and over 50 percent of the trunk roads have oiled surfaces. At the same time, due measures were taken to improve the layout of highways and to upgrade highway technology, with the result that 81 percent of the trunk roads are up to the standard above the fourth grade. Great improvements have also been made in the technology of culverts and ferries, while the total length of bridges has increased from 55,000 linear meters in 1957 to 4 million linear meters, and the length of bridges for each

kilometer of highway has doubled. The transformation of wooden bridges and the replacement of ferries with bridges have raised the proportion of permanent bridges from about 20 percent (statistical data for the initial period of the People's Republic not available) to more than 96 percent and have reduced the number of ferry points on the trunk highways every year. Mechanized ferrying is now used at 87 percent of the ferry points. Through some minor improvements by the maintenance squads and some large-and medium-scale repairs, many protective facilities, such as retaining walls, revetments, aprons, grouted side trenches, roadside blocks and so forth have been added. Many important roads are now basically free from damage by flood and from the danger of cave-ins. Tree-lined highways have increased from 18,000 km in 1965 to more than 300,000 km and their proportion in many provinces and municipalities now exceeds 75 percent.

Third, highway maintenance has helped to improve the economic results of transportation and to support rescue work, industrial and agricultural production and national defense. Because of better maintenance, increased surfaced roads, improved bridges and highway layouts and higher traffic capacity, the average speed of vehicles on many trunk highways has been increased from about 15 km to about 40 km per hour. In a comparison between 1980 and 1962, according to statistics the annual tonnage carried by trucks of the highway transport departments has been increased by 54 percent; the cost per ton/km, lowered by 31 percent; fuel consumption, reduced by 6 percent; and the service life of tires in terms of mileage, doubled. Such remarkable economic results are naturally attributed to better vehicle performance and better administration; however, improved road conditions are an important factor, since the index of transportation efficiency would be high wherever road conditions are good. In the past 35 years and more, many large rivers in our countries have caused floods, while earthquakes have wrought havoc in some areas. The damage to highways from floods has been very serious, although many of them could quickly restore traffic, thanks to timely repairs by road maintenance personnel. In 1975, the Zhumadian area in Henan had an extraordinary flood. However, since the oil-surfaced roads and permanent bridges had strong antiflood capabilities, the highways were reopened as soon as the water receded, thus meeting the requirements of production and rescue work. In the counterattack in self-defense against Vietnam, the road maintenance personnel in Yunnan and Guangxi made great contributions in supporting the front in transportation.

We have traversed a tortuous course in road maintenance during the past 35 years. This course, in my opinion, can be divided into six different stages:

- (1) During the period of national economic recovery in 1949-1952, the central task in highway work was to restore the wrecked highways. Therefore, highway administration organs and road maintenance contingents were set up at all levels. "Regulations for Highway Maintenance," "Regulations for Reserving Land for Highways," "Regulations for Mobilizing Civilians in Road Maintenance," "Regulations for the Collection and Use of Road Maintenance Fees" and other rules and regulations were formulated

under the principle of "maintaining and protecting all roads." A general survey was conducted on the highways and civilians were organized to repair the highways and bridges quickly. By the end of 1952, more than 126,000 km of highways were open to traffic, and the mileage under regular maintenance was also greatly increased. These measures laid an initial foundation for developing highway traffic.

(2) The First 5-year Plan period was one of stable development in highway maintenance. The road maintenance force was further strengthened, and the three different forms of maintenance--namely, professional maintenance, a combination of professionals and the broad masses in maintenance and maintenance by the broad masses--basically took shape. Also, in accordance with State Council's "Directive Concerning the Improvement of Civilian Work Force in Road Maintenance and in Building and Repairing Local Roads" issued in 1955, more civilian teams were used in place of the road maintenance squads and the mileage of highways under regular maintenance was further increased. The Ministry of Communications also issued the "Technical Standards of Road Maintenance" in which the principle of "treating the maintenance of good roads as the central task, strengthening all-round maintenance" and "making better use of roads through gradual improvements in maintenance" was announced. With locally available materials, the road maintenance personnel energetically improved the dirt roads, increased the mileage of all-weather roads and popularized the protective method of adding an asphalt wear and tear layer, a protective layer or reclaimed sands to the surface of macadam roads. They also conducted a thorough inspection of roads, kept a record of the road conditions and did some infrastructural work to improve the quality of highways. In a comparison between 1957 and 1952, the mileage of highways under regular maintenance doubled, and the surfaced roads increased 1.2-fold. At that time, the General Highway Administration Bureau under the Ministry of Communications was in unified control of the annual road maintenance plans of all provinces and in charge of the centralized distribution of subsidies for repairs of flood damage and for the maintenance of national defense highways. An exchange of experiences in supervision and inspection was conducted in good time, the structure of the entire road maintenance system was sound and stable, the personnel were hard working, the quality of engineering was good and the maintenance cost was low. Although the revenues from road maintenance fees were small, averaging less than 500 yuan per kilometer in 1957, the road conditions continued to improve.

(3) The period from the "Great Leap Forward" in 1958 to the time of national economic difficulty in 1961 was one of deterioration in the quality of road maintenance. The highway departments implemented the principle of "relying on the localities and the masses and stressing popularization" and within 2 years, the number of highways doubled. However, their low standards and inferior quality made the work of maintenance more difficult. Because of the downgrading of the system of maintenance and administration accompanied by the relaxation of rules and regulations and excessive downgrading and decentralization in many areas, the maintenance of some important trunk roads, divided into sections, was delegated to the communes

and production brigades, and even the professional maintenance contingents were disbanded. Furthermore, because of reduced revenues from road maintenance fees, the frequent instances of floods and the workers' difficulties in their livelihoods, work efficiency was impaired and highway conditions deteriorated in many areas. However, some areas and organs remained stable and were able to keep the trunk highways in good operating condition.

(4) The period of national economic readjustment from 1962 to the first half of 1966 was one of a second stable development in highway maintenance. The highway departments conscientiously implemented the central authorities' principle of readjustment, consolidation replenishment and improvement," actively restored and strengthened the road maintenance contingents and further improved various rational rules and regulations. In 1962, based on a report from the Ministry of Communications, the CCP Central Committee and the State Council jointly issued the "Directive Concerning the Strengthening of Highway Maintenance and Management" which clarified the principle of "effective consolidation by strengthening maintenance, active recovery and gradual improvement" in highway work as well as the principle of unified leadership and differentiated administration and laid down the basic policies concerning the establishment of administrative organs and work force in addition to such major issues as revenues from road maintenance fees, civilian labor for construction and maintenance, highway administration, the workers' livelihoods and so forth. On the basis of these principles, the Ministry of Communications again worked out the 40-point "Provisional Regulations on Highway Maintenance and Administration" and set up the rules for various types of administrative jobs, thus leading the work of highway maintenance on to a path of healthy development. In 1963 the State Council approved and relayed three reports from the Ministry of Communications concerning the addition of an asphalt layer for wear and tear to the road surface, the transformation of wooden bridges and the repair of flood-damaged highways. These measures, aided by the steady increase in revenues from road maintenance fees, guided the work of road maintenance into a new stage of gradual improvement. A national conference on highway maintenance held in the same year also affirmed the future policies and tasks besides setting the long-range goals of forming an all-embracing highway network, standardizing the roads, building permanent bridges and culverts, surfacing the roads with asphalt, lining them with trees and achieving mechanization in road maintenance. Measures to attain these goals were also worked out. Thanks to the efforts of all the road maintenance workers, we not only quickly restored the highway's technical levels but also increased the proportion of surfaced roads from 44 percent in 1959 to 60 percent in 1965, including an increase in the high- and middle-grade surfaced roads from 1,500 to 5,500 km. Revenues from road maintenance fees again tended to increase every year, and in 1965, the average receipts per kilometer amounted to 900 yuan, a 50 percent increase over 1959.

(5) During the 10 years of turmoil, the leading organs were for some time paralyzed and the road maintenance contingents received even heavier blows. Yet, as far as the improvement of highways was concerned, it could still be called a stage of uneven development. In these 10 years, the

proportion of surfaced roads was increased to 70 percent, the length of roads surfaced with asphalt was increased to 100,000 km and the total length of bridges, mostly of a permanent type, nearly doubled. The mechanical equipment for road maintenance also increased rapidly. These achievements were mainly due to the efforts of the road maintenance personnel in resisting the interference and disruptions from the "gang of four," in firmly guarding their posts and in continuing to implement established principles and policies. Another cause is that along with the increasing number of vehicles, revenues from road maintenance fees increased every year, and a certain portion of them could be appropriated for improving the engineering work. Of course, serious damage was sustained during the turmoil. For example, the administrative organs and work force were in a state of unrest and subjected to incessant torments; the importance of technology was universally ignored, resulting in the loss of control over engineering quality; the plans were not properly worked out and the practice of stressing repairs and neglecting maintenance became prevalent; road conditions deteriorated from lack of repairs and maintenance; embezzlement was rampant and waste serious from inadequate financial control; administration was lax, resulting in damage to many highways; the workers' morale was low because of low remuneration; and so forth. Furthermore, in the absence of guidance from unified planning, there were serious discrepancies between different localities in revenues from road maintenance fees and, without adjustment by the central authorities, the development was very uneven between different areas, between repairs and maintenance, between the trunk and the branch highways, between bridges and roads and between production and livelihood. We can positively say that had the state been spared this turmoil, we would have achieved even greater success on these 10 years, and our highways and their technical level would never be as backward as they are now.

(6) After the downfall of the "gang of four," and particularly after the 3d Plenary Session of the 11th Party Central Committee, the work of highway maintenance, after readjustment and consolidation, again entered a new stage--the stage of development. In dealing with the existing problems, regulations were worked out for the collection, use and control of road maintenance fees, an accounting system was set up for road maintenance and financial management was strengthened. We also worked out regulations for inspecting and evaluating the quality of highway maintenance so as to strengthen technical control. The State Council was requested to issue directions concerning the strengthening of highway administration so as to stop any action of encroaching on or damaging the highways. We also worked out a trunk highway network to be approved by the State Council, whereby the necessary conditions could be created for long-range planning, differentiated administration and the undertaking of key projects. The system of economic responsibility was experimented with in the road maintenance sections and squads so as to arouse the workers' enthusiasm and to improve economic results. In 1982, the Ministry of Communications held a national conference on highway maintenance to sum up and exchange the experiences, both positive and negative, since 1963, to implement the relevant directives of the Party Central Committee and the State Council and to study the new developments and new problems as well as the concrete

policies, tasks and major measures for the next several years. The conference also set the objectives for 1990 and pointed out the direction for further development in the work of road maintenance. The "Highway Laws" and the new technical standards of road maintenance are now being compiled, the maintenance contingents are being strengthened, the livelihood of the workers is gradually improving and the revenues from road maintenance fees are steadily increasing. The fine situation on the entire road maintenance front is unprecedented.

In reviewing the work of highway maintenance in the past 35 years, we feel that we have gained rich experiences and learned valuable lessons. What we have learned from our experiences is mainly as follows:

First, we should uphold the principle of unified leadership and differentiated administration. The national and provincial trunk roads and some important county highways should be under the unified administration of the provincial administration organs so that professional road maintenance personnel can remain basically stable.

Second, the road maintenance fees should be properly collected, controlled and used. We should strengthen the management of planning and finance so that funds can be used to even better advantage.

Third, we should rely on the localities and the broad masses in implementing the principle of building and managing public projects by the local people with or without state subsidies.

Fourth, we should regard science and technology highly and actively train specialized personnel, study and popularize the advanced technologies of China and foreign countries and continue to raise the technical level.

Fifth, we should strengthen the basic-level units and strive to improve the methods of management so as to arouse the workers' enthusiasm and initiative.

Sixth, we should perfect the legal system and carefully attend to highway administration so as to prevent willful acts of destruction.

The road maintenance workers are now facing an arduous task. They have many difficulties, and the gap between our work and that of advanced countries is still very wide. The policy of opening to the outside world and invigorating the domestic economy has also given rise to many new problems. However, we deeply believe that under the correct guidance of the Party Central Committee's principles and policies, and through the united efforts of all road maintenance personnel, our highway construction can certainly develop rapidly.

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TAIWAN

YU KUO-HWA ON PROMOTING ECONOMIC GROWTH

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[Text] Taipei, 25 Dec (CNA)--Premier Yu Kuo-hwa said Tuesday that the Republic of China's economic growth rate will reach 10.9 percent this year, with the fluctuation rates of both the wholesale and consumer prices less than one percent, indicating that the Republic of China on Taiwan is one of the few fast growing economies and also one of the countries with the most stable prices.

The premier made the statement in a report to a joint meeting of the National Assembly and the assembly's Constitutional Research Council at the Taipei City Hall.

According to Yu, per capita GNP in this nation will reach U.S. dollar 3,000 this year, while that for next year is estimated at U.S. dollar 3,370, when the economic growth rate is targeted at 8.5 percent. As of the rise of commodity prices, the government will try to keep it at below 2 percent so as to live up to the principle of "seeking progress in a stable condition," he added.

Stressing the government goal of making the economy continue to grow in a fast changing world economic situation, the premier said all economic measures will be directed toward "internationalization, liberalization, and systematization" of the nation's economy.

The current focus in government economic policy is "increasing investments and promoting growth," hoping to encourage more private investments by making more, large public investments itself, Yu noted.

He reiterated the government plan to carry out the 14 key development projects enumerated in his administrative report to the Legislative Yuan, saying most of these projects will be accomplished within six years, while the rest will be finished within ten years.

In the area of social order, the premier emphasized the government determination to achieve peace, harmony, and purity in society, affirming that the "Yi-ching (sweeping) campaign" aimed at eliminating organized crime will be carried through and other "social poisons" will be eradicated step by step in the future. He said social morality has changed a great deal as a result of

the rapid industrial and economic development, bringing about increasingly serious irregularities and crimes which have reached an extent where "social order and people's life and property are threatened."

To assure national security, to maintain social order, and to protect people's rights, he asserted, the government has reserved no efforts since last month in implementing the "Yi-ching campaign," arresting leading gangsters who had most threatened social order and bringing them to justice.

Premier Yu emphasized that ridding society of its "cancers" by dealing criminals a fatal blow is a long-range priority work for police units here.

Therefore, he pointed out, the government will take actions to "clear away" all forms of social poisons that corrupt people's minds, spoil social morality, and drive a wedge among the people.

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TAIWAN

ECONOMIC OFFICIAL SPEAKS ON FOREIGN INVESTMENT

OW240439 Taipei CNA in English 0234 GMT 24 Dec 84

[Text] Taipei, 23 Dec (CN)--Vice Economic Minister Wang Chien-hsuan said Sunday that the government has adopted a new policy to permit domestic entrepreneurs making investments abroad.

Speaking at the annual meeting of the Chinese Economic Reconstruction Society, Wang said that the ease of government control on making overseas investments evidences the increasing economic strength of this country. He urged entrepreneurs here to pool their efforts to explore new markets abroad.

Although the Republic of China on Taiwan has a population of merely 18 million, it now ranks the 16th among the world trading nations, and it has been deemed as a model for the developing countries to follow, he said.

The vice minister also discussed the investment climate in the Caribbean Basin, but advised those entrepreneurs wishing to make investment there to pay attention to the public facilities and language barriers as conditions for selection of their plant sites.

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TAIWAN

BRIEFS

PROJECTED PER CAPITA GNP--Gaipei, 20 Dec (CNA)--The Council for Economic Planning and Development (CEPD) yesterday approved a list of growth targets for the coming year which envisions among other things an 8.5 percent rise in overall performance and a per capita GNP (gross national product) of U.S. \$3,369. Estimates of the 1984 growth rate is 10.8 percent and that of per capita GNP is US \$3,003. Other economic targets set for 1985 include the following: Wholesale price increase: 2.5 percent at the most; foreign trade: 60.8 billion U.S. dollars as compared with 5.2 billion dollars in the current year, with a favorable balance of 7.9 billion dollars, roughly the same as the 1984 level; agricultural output: 1.5 percent as compared with 2.4 percent in the current year; industrial output: 9 percent as compared with 13 percent this year; service industries: 8.2 percent as compared with 8.9 percent this year. CEPD said the growth target can be achieved only by encouraging investment in the private sector and continued implementation of major development projects. [Text] [Taipei CNA in English 0942 GMT 20 Dec 84 OW]

AIR TRANSPORTATION STATISTICS--Taipei, 20 Dec (CNA)--The nation's air passenger traffic and cargo volume grew three-folds and four-folds respectively compared with those a decade ago, Liu Teh-Ming, director general of Civil Aeronautics Administration [CAA], said yesterday. Meeting reporters at the tourism bureau's travel information service center, Liu said "Our civil aviation industry has reached the international standards for the developing countries, in consideration of our rapid growth and air services." Between 1973 and 1983, Liu said, the annual passenger loads jumped from 3 million-odd to 10 million-odd, while the annual cargo loads rose from 750,000 metric tons to more than 3 million metric tons. During the same period, air service on international routes expanded from 2 stops to the existing 19 stops, and domestic air routes grew from three to the present 14 routes. In terms of international flights, China Airlines, the nation's flag carrier, operates 176 weekly flights around the world, while foreign airlines serve 278 flights to and from this country, the CAA director general said. He also told reporters that during the past 10 years, domestic airlines increased from 2 to 5, while foreign airlines offices here jumped from 2 to the present 18. [Text] [Taipei CNA in English 0946 GMT 20 Dec 84 OW]

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